The Builder.

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ILLUSTRATIONS.

Armstrong College, Newcastle-upon-Tyne..... Mr. W. H. Knowles, F.R.I.B.A., F.S.A Architect
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2. Principal Entrance, Hall, Council Room, and Principal's Room.

Sculpture at the Royal Academy:—
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" " "Justice"..... By Mr. F. E. E. Schenck.
Plate II. "Madonna and Child"..... By Mr. Bertram Mackennal.
" " "A Royal Game"..... By Mr. W. Reynolds-Stephens.
" " "Narcissus"..... By Mr. A. Bertram Pegram.
" " "Pax"..... By Mr. Oliver Wheatley.
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Work and Play at the Architectural Congress.

IN offering a hearty welcome to all our foreign colleagues who are to visit us next week, we may perhaps usefully give a little *résumé* in advance of what is to be offered to them both in the way, as one may say, of work and play; of questions to be seriously discussed and opportunities offered for recreation and sight-seeing.

The Inaugural Ceremony at the Guildhall and the Soirée given by the Royal Academy will, we hope, be well attended, and at the latter our guests will have the opportunity of finding out that our sculpture is probably better than they were aware of, and of judging whether the Royal Academy painting is really the contemptible business which a clique of English critics delight in declaring it to be.

On Tuesday the subject of steel and reinforced concrete will be discussed simultaneously with that of the employment of salaried officials to produce the public architecture of a country. It is not likely that these two subjects will attract the same persons; one is purely constructional, and the other purely concerned with what we may call æsthetic administration. But Hatfield and Hampton Court in the afternoon offer a choice; and we should recommend foreigners rather to take Hatfield, for they will there see a typical example of an English mansion of the best period for that class of building.

On Wednesday the question of how far the architect should receive the training of the craftsman is divided against those of the organisation of Public International Competitions and Copyright and the Ownership of Drawings. In regard to the latter subject, foreign architects may learn, probably with some surprise, how the profession is treated by English law, and it is to be hoped that their votes and their eloquence may support us in an attempt to shake off our fetters. In the evening the simultaneous subjects of the planning and laying out of streets and the conservation of national monuments by Government are both of the greatest interest, but we may suggest that the latter is really the more important of the two, since it concerns the preservation of a chapter of our national history.

On Thursday we hope that the subject of the control of the architect over other artists or craftsmen in the completion of public buildings will receive every attention, for it is not only an important but a difficult one. The rival subject "The education of the public in architecture" is somewhat vague and (in our opinion) hopeless—in this country at least. Among the numerous visits for the Thursday afternoon visitors may find it difficult to choose; but we should recommend those who do not know it to see Windsor Castle, only with the reservation that they will find little of architectural interest there; what they will find is romantic beauty of situation and picturesque effect, and a great collection of art treasures. Those who do not leave town would do well not to neglect Dorchester House, one of the finest modern houses on the Italian model, and containing some work by a great sculptor.

For the visits on Friday we should certainly recommend visitors who have not been to Oxford or Cambridge to see one of them—Oxford perhaps by preference; for though Cambridge possesses in her "backs," and in the great quad of Trinity, and the King's College Chapel, separate attractions which are superior to any single attraction of Oxford, the *coup d'œil* of Oxford is more concentrated and impressive; so much so that a distinguished German art-critic declared that the High-street of Oxford had not its equal in the world.

On the morning of Saturday we may suggest that visitors will find it more interesting to visit Bridgewater House, the work of one of our great English architects, and containing a fine collection of pictures, than to discuss the vexed and rather unnecessary question of the statutary qualification of architects. For the simultaneous visits in the afternoon there is the choice between modern Gothic at the Houses of Parliament and Westminster Cathedral, and Wren classic at Greenwich. The exterior aspect of Greenwich from the river approach is noble and well worth seeing, but we may warn the stranger that the interest is pretty well confined to the exterior view.

The farewell banquet will at all events, we hope, be unanimously attended.

SCULPTURE AT THE ROYAL ACADEMY.

AS has been the case several times in recent years, the sculpture at the Academy is the best department of the year's exhibition, not only because there is work that stands higher in its class than anything among the paintings, but also because the relative proportion of good to poor work is larger. This however may partly be accounted for by the fact that the space given for sculpture is so much smaller and the number of works therefore more restricted. If we had eleven rooms filled with sculpture it is possible, in spite of the remarkable advance in English sculpture of late years, that we might find the proportion of meritorious work much the same as among the pictures.

We may divide sculpture broadly into two classes; that which represents a very simple idea, or perhaps represents merely form and composition for their own sake, and that which expresses a more or less complex poetic idea which is of importance in itself, apart from the execution. Of this latter class there is much less in England than in France, and it generally does not belong to the highest class in an artistic sense. The best English work is usually to be found in the shape of finely modelled figures of only vague and abstract signification, and which appeal to the purely artistic perception rather than to the imagination. And on the whole this is the safest path for the sculptor. Occasionally one may find a work, like Boucher's "Antique et Moderne," which expresses in the severest sculpturesque form a very pregnant intellectual idea; but on the whole it is rather dangerous to endeavour to express too much in sculpture, an art which should be symbolical rather than didactic. Thus Mr. Garbe's "Der Selbstsüchtiger" (why a German name?) in the Octagon, though a thoughtful work, attempts to express a little more than can be clearly conveyed, and fails also in sculpturesque beauty of line.

The central work in the Octagon, the "Death of Dirce," is a turbulent piece of work of no high quality, which is in fact a mere *variant* on a well-known antique group, and therefore has not even the interest of originality. In purely sculpturesque quality perhaps Mr. Brock's colossal relief of a nymph and triton for the Queen Victoria memorial is the finest thing of the year, though it can hardly be said to express an idea at all; it simply captivates by its grandeur of line and fine modelling; if it is a specimen of the decorative sculpture which is to adorn the Victoria memorial, we may look forward to the erection of a great work of art in front of Buckingham Palace. Mr. Mackennal's colossal bust of War (see Plate III. of the sculpture illustrations in this issue) is a powerful work, but hardly intense enough to symbolise war (one remembers Gérôme's "Bellona" in a former year); we should rather have taken it to mean "Anger." Mr. Fehr has produced a figure of "A Fallen Angel" which is rather forced and distorted in attitude but a successful work of its kind. So also are Mr. Crook's "Eurydice" and Mr. Hampton's "Orpheus" (for which latter see Plate III.), but they belong, like Mr. Goulden's "Phryne" in the Lecture Room, to the class of well-executed figures which lack individuality of conception and might as well be called by other titles as those they bear; indeed, we suspect that the Phryne referred to was merely labelled by that name after completion; there is nothing whatever in the character of the head to suggest the Greek courtesan; an example of the frequent mistake of sculptors and painters in giving a classical title to a figure which is quite at variance with its associations. Mr. Clemens's "Eurydice," on the other hand (to return to the Octagon), is a distinct effort to realise the idea suggested by the name; Eurydice lies prone as if exhausted, her head raised, as we may suppose, to look longingly after Orpheus; and the head is a very beautiful and expressive one.

Mr. Oliver Wheatley's decorative bas-relief "Pax" (Plate II.) is a very different class of work from that which we are accustomed to associate with his name; he has hitherto generally been the sculptor of pure form, a figure seen in some momentary action or attitude of purely sculpturesque interest. "Pax" is a work of more poetic meaning and treated in a decorative rather than a sculpturesque manner. His reading of the subject is far from commonplace; it is not the usual girl with the olive branch; it is the still armed figure, reminiscent of conflict, almost sad at the recollection of it, and leaning on her shield and trident which are now to be laid aside. It is a very interesting work, serious and thoughtful in conception; the cornice at the head of the panel, bearing the sculptured cross and doves, is perhaps a little heavy in proportion and outline for the rest. With this grave work we may contrast one or two of those which seem intended to show how sculpture can be used in a more playful spirit, more especially Mr. Olson's "La Gamine," a nude figure of a little girl partly encircled by a hoop and putting out one foot playfully on the back of a large tortoise before her; the decorative pedestal is designed to be in harmony with the rest, with a smaller tortoise worked upon each angle; it is an original and piquant production. Mr. Montford's "A Court Favourite" is a good study of a very thin nude youth playing with a panther; Mr. A. C. White's "Naiade" next to it is again what one may call a conception of mischievous expression in sculpture, not without interest, but undecorative in its pose and lines.

On Plate III. we give a representation of the new and original treatment which Mr. Toft has given to a portrait group of his three children, treated in a decorative form: the busts of two of the children being arranged at each end of a long pedestal, the half-length of the elder one standing over them in the middle with a hand placed tenderly round the neck of each of the others, and holding with the tips of her fingers a scroll which extends in front of her. It is an original work, pleasing both in sentiment and in decorative effect. Then we have in the Octagon two or three works of monumental sculpture, of which Mr. Goscombe John's "Sir John Woodburn" is one of those realistic portrait statues in official dress which, however good as likenesses, seem to represent about the very last use to which sculpture should be put. It is in marble, too; a work of this kind is at all events better suited to bronze. Mr. Henry Pegram's "Sir Thomas Browne," the life-size model of the bronze statue at Norwich, has been illustrated in our pages; it shows the author of "Religio Medici" seated and contemplating a broken ancient pitcher which he holds in one hand. It is a very suitable monument to Browne, though it may be objected that this also is a piece of realistic costume sculpture; but the costume is in itself more picturesque than that of the Sir John Woodburn figure; besides which, it must be admitted that costume of a past age, which is not directly connected with everyday and commonplace associations of life, does not affect us with the same sense of incongruity. Mr. Nicholson Babb has attempted something more poetical in his "Memorial to men who fell in the Boer War," to be erected at Grahamstown. This is a group of a dying man in uniform sinking on the ground, and a winged draped figure standing over him and looking down with a fine expression of sympathy. This is a well intended work in the right spirit, though the extremely robust and largely developed figure of the angel seems a little prosaic in comparison with the intended idea.

In the Lecture-room also memorial sculpture occupies a prominent place, more especially in Sir W. Richmond's remarkable monument to Mr. and Mrs. Gladstone. The finest thing about this is the incident of the winged angel at the head of the monument, bending over the two recumbent figures; a really beautiful and novel idea, which imparts a peculiar solemnity of sentiment to the whole group. The pedestal itself is a somewhat important work; the sides are decorated with groups in relief in circular panels, two on each side; the outer two representing Paolo and Francesca with the figures of Dante and Virgil, and a Homeric scene with a body on a funeral pyre and a warrior seated by it, which we do not exactly identify; the two panels on the inner side (next the wall of the Lecture-room) appear to symbolise Instruction and Family Life. Between the circular panels are upright niches with figures of saints or heroes. On the upper end of the pedestal is a bas-relief of Christ and the Maries after the crucifixion; on the lower end is one illustrating the offerings of the Wise Men at the Nativity. The exhibit is only a full-size model, not the work itself; in the executed work, with the actual materials to be employed, the architectural portion of the monument will probably have an effect of finish which it rather wants in the model. Another monumental effigy is that of Dean Hole by Mr. F. W. Pomeroy, a recumbent figure treated in a simple and dignified manner. The opposite position is occupied by Mr. Brock's portrait statue of Gainsborough, standing and arrayed in the dress of his period, a marble statue which would have looked better and more suitable in bronze; the head is fine and energetic; the work is to be placed

in the Tate Gallery. The fourth of the leading works in the centre of the room forms a curious contrast to the solemnity of the Gladstone monument opposite, being a piece of half-playful *genre* sculpture treated as a historical allegory. This is Mr. Reynolds-Stephens's "A Royal Game" (see Plate II.), and represents Queen Elizabeth and Philip II. of Spain seated facing each other on either side of a chessboard and playing a game in which the pieces are little models of ships, with one of which Philip is just making his move; the two sovereigns are clad in the court dress of their period. Whether this is quite the kind of thing for sculptural treatment is a question; but taking it for what it is, there can be no doubt that it is one of the cleverest and most successful works ever exhibited in the Lecture-room. The contrast between the anxious look and furrowed brow of Philip and the cool and half-sarcastic countenance of the English Queen, playing with a locket at her throat as she meditates her next move, is as dramatically effective as it is true to history, and we may congratulate the sculptor on a work which is the best he has yet produced, and which attracts a good deal of interest among the visitors. We regret not to have an illustration of it on a larger scale, but the photograph which the sculptor sent at our request was but a small one, and did not do justice to his work. Among the other works occupying the centre of the floor is one of which we give an illustration, a half-scale bronze "Madonna and the Child Christ" by Mr. Mackennal (Plate II.), which is a new treatment of the subject, showing the Christ not as an infant in arms but as a somewhat older child standing erect in front of the Madonna, who guards him with her hands. The upright composition of this group, with its strongly marked vertical line, is unusual and very effective. The two nude statuettes of children, "The Magic Shell" by Miss Reed, and "Youth and Immortality" by Mr. C. Rutland, though not works of the first order, represent ideals in sculpture of the right kind.

Among the works placed round the room we like nothing better than Mr. Schenck's large relief "Justice," which forms one of our principal illustrations (Plate I.). The lines of this are fine; the contrast between the high relief of the central figure and the low relief of the side ones is very effective, and the pierced panel with the child figure above is a new idea in a work of this kind. Mr. A. H. Hodge's "Commerce," of which we also give an illustration, occupies the central portion on the opposite wall. Among the other works round the room is a beautiful bust of a young girl, "Thirteen," by Mr. Goscombe John, which may help us to forget his unfortunate portrait statue in the Octagon; and a figure of a youth under the title "Narcissus," by Mr. A. J. Leslie, which has a distinctive character and treatment; a graceful, upright, nude figure with the head just inclined as if glancing downwards. The subject of Narcissus is also treated by Mr. Bertram Pegram in a recumbent statuette (Plate II.). Mr. Derwent Wood's life-size group, "Abundance," is illustrated on Plate III., perhaps not from the best point of view; but as a composition it strikes us as wanting decision and decorative character of line; as a group, it seems somewhat "lumpy" in effect. Mr. H. Pegram's relief "By the Waters of Babylon," gilt bronze within a carved wooden frame, is more effective as decoration than interesting as a sculptural design. Mr. Gilbert's brilliant little sketch for a group of St. George and the Dragon and Victory is just the thing for working out on a small scale in precious metals and other decorative materials; on a large scale the wings of the Victory and the cresting of the knight's helmet would be preposterous in scale; in miniature sculpture they are effective and suitable enough.

Among other things to be looked at are Mr. Colton's two busts of the Maharaja of Mysore; Mr. Lucchesi's pretty life-size group of "The Bud and the Bloom," a girl child playing with her grown-up sister, both of them nude figures of purely sculptural character; Mr. Frampton's fine bust of G. F. Watts; and Mr. Pomeroy's relief tablet in bronze to Archbishop Temple, to be placed in St. Paul's Cathedral. This shows a portrait figure of the late Archbishop kneeling, in robes which spread out behind the figure, the head being, as we so often see in Greek sculpture, in higher relief than the rest of the figure; the field of the composition is filled up with a decorative cartouche for an inscription. The whole is a fine work with a serious feeling about it; indeed its rather tender and reverential sentiment seems little in keeping with the public character of an ecclesiastic who, like Browning, "was ever a fighter"; but it is only fitting to forget these characteristics in a monument, which after all may express a side of character different from that with which Temple faced the world, and not less his own.

As a whole, though we have known better sculpture years at the Academy, the present exhibition shows that the standard of English sculpture is still maintained at the high level to which it has arrived of late years, and which affords such a wonderful contrast to what one remembers of the Academy sculpture-rooms some twenty years ago.

NOTES.

The Highgate Tramway Disaster. IN the face of the evidence given at the Coroner's inquest, the jury could scarcely be expected to bring a different verdict from that recorded on Tuesday. The accident was certainly caused by the wheels skidding and the brakes failing to act, and it is equally certain that the driver made a mistake in applying the hand brake first instead of the magnetic brake, especially when he already had reason for believing the hand brake to be out of order. As only two of the wheels showed "flats" after the accident, it seems probable that the remaining wheels were not skidding all the way down the hill, and if the driver had not kept the lever in the reversed position after he found the wheels were locked it is possible that the car might have been brought under control by the magnetic brake. Although the driver was insufficiently experienced, there is evidence to show that something was wrong with the hand brake. The traffic manager to the tramway company admitted that three complaints had been made against the car in question for stiff brakes and flats on the wheels, and the repair superintendent stated that nothing was done to remedy the stiffness because he knew it would wear off after a time. These are points into which we hope the Board of Trade inspector will inquire, for it is most undesirable that any car should be used for public service when the brake apparatus is not working satisfactorily, even if the defect is one that will not necessarily cause accidents when the car is in the hands of a thoroughly experienced driver.

Tramway Accidents. THERE seems to be quite an epidemic of tramway brake failures. Since the disasters at Highgate, Swindon, and Halifax, reports have been received of similar accidents at Mansfield, in Nottinghamshire, and near Puritan, in Pennsylvania, U.S.A.; while two tramcars ran off the metals at Kennington Oval on Saturday last. From one point of view it is fortunate that all these mishaps should have occurred in a cluster, for they have demonstrated in a most useful manner several dangers for which safeguards have to be provided. At Highgate the hand brake was the cause of trouble; at Swindon the magnetic brake seems to have been out of order; at Halifax, hand, magnetic, and emergency slipper brakes were unable to prevent the car from running away; and at Mansfield the car ran backwards because the hand brake was defective and the magnetic brake would not act. The Mansfield accident shows the necessity for brakes of the kind mentioned in our "Note" of June 30; the Kennington derailments serve as a hint that magnetic brakes are useless when cars have left the rails; and the disaster in Pennsylvania proves that we need not look to America for effective braking apparatus. The problem now before tramways engineers and the Board of Trade is undoubtedly a difficult one, which in view of recent events must receive careful attention from every possible standpoint.

King Edward VII. Bridge, Newcastle. BY the desire of the King the new high-level bridge at Newcastle-on-Tyne, opened by His Majesty on Tuesday, has received a title which is in every way appropriate and welcome, although not quite so concise as might be desired. The work is the most important undertaking in the way of bridge construction which has been attempted in this country since the completion of the Forth Bridge, and comprises four steel lattice girder spans of 191 ft., 300 ft., 300 ft., and 231 ft. respectively from north to south. The under sides of the girders are 83 ft. above high-water level, thus providing ample headroom for navigation. The spans are supported on granite piers, the foundations of which were taken down to 69 ft. below high-water level by means of caissons. Between abutments the bridge has the length of 1,150 ft., the total length being rather more than half a mile, including the approaches.

In addition to affording a much-needed addition to the cross-river communications of the district, the new bridge has enabled the North-Eastern Railway Company to abolish the inconvenient method necessarily adopted hitherto of running all main line trains into the Central Station on one curve and taking them out in the opposite direction on another curve. In future main line traffic will enter the Central Station from the south along a new line, and, if necessary, trains can be run through Newcastle without stopping. The new bridge has been built from the designs of Mr. C. A. Harrison, the engineer to the North-Eastern Railway, and is a structure whose simplicity and correct proportions are features deserving special commendation.

County Council Finances.

THE weak point of a debate in the House of Lords is that it is a discussion without a practical result. Thus when the London County Council Money Bill was discussed on Monday some useful general criticisms were made, but they are mere academic advice, since nothing was inserted in the Bill to prohibit it. The Bill in question sanctioned loans to the amount of twelve millions, and it was read a second time. It was pointed out during the debate that Manchester and other provincial towns could borrow at a cheaper rate than London. In other words, the financial credit of the Metropolis is lower than that of the great provincial towns. The fact is that there is no little indefiniteness about the borrowing of the London County Council, no limit is fixed not by a Bill but by policy. It is all very well to say that London should not go so fast; what is needed is that some idea should be given as to the loans required for some time ahead, and the probabilities of revenue from street improvements and similar sources. The general impression left by the debate is that those responsible for the financial management of the London County Council are somewhat wanting in restraint.

Rights under Building Schemes.

THE case of Whitehouse *v.* Hugh, commented upon in our Notes, December 2, 1905, has been carried to the Court of Appeal. Certain land in 1875 was being developed by the Birkbeck Freehold Land Society, under a building scheme. In 1878 the plaintiff's predecessor in title had purchased certain plots from the Society, and, having erected a house, had in 1885 conveyed it to the plaintiff. The house was a corner house, and at one side was a roadway, which in 1873 had been roughly made up by the Land Society but never metalled, and at the time when the plaintiff purchased the house this road was overgrown with weeds. Subsequent to the purchase to the plaintiff the Land Society had blocked up this roadway and conveyed the road to the defendant's predecessor in title. The Defendant in 1904 commenced to build on this site, and this action was brought by the plaintiff to restrain him from so doing. On the conveyance to the plaintiff's predecessor in title the road was only marked as "vacant space," and one of the conditions to which the conveyance was made subject was that the vendors had power to allow a variation of the plans and conditions. The Court of Appeal affirmed the decision of the Court below, dismissing the action on the same grounds, viz.—that the claim to the road as being contained in the plans could not be sustained because of this latter condition; that there was no right obtained by user as the road ended in a *cul-de-sac*; and that there was no dedication to the public by the Land Society. A claim to obstruction to light and air was not persisted in on the appeal.

The Authority of Architects.

THE case of Betts, Ltd. *v.* Pickford's, Ltd., which is reported in the current number of the *Law Reports*, contains a practical point of some importance as throwing light on the extent of an architect's authority. In this instance Pickford's leased a piece of land on which were some buildings to Betts for the purpose of erecting a warehouse, for which windows and light were needed, and for which Betts stipulated. Pickford's also agreed to clear the land of the above-mentioned buildings, one of which was a large shed which partly occupied the ground, and therefore this part was demolished, leaving however the ends of several of the roof timbers projecting over the boundary line by three inches, and four iron stanchions also stood the same distance within the boundary. During the erection of Betts' new buildings their architect, without their authority or knowledge, verbally agreed with Pickford's architect that the above-mentioned ends and stanchions should be built into the new wall. The result was that the wall became under the London Building Act a party wall, and the Court held that this was a derogation from the grant by the defendants. Then the point arose, was the agreement as to the building in of the stanchions and ends within the scope of the architect's authority? The Court held that it was not. His authority was "to superintend the erection of the buildings . . . according to the plans which had been approved." The Court also remarked that his authority to do the above work could not give him any implied authority "to allow these stanchions and roof beams to be built into the wall." The agreement was no doubt a sensible one, and in many places would have raised no difficulties, but under the London Building Act it produced the intervention of the County Council by making the new wall a party instead of a non-party wall.

Landlord and Tenant.

AN interesting point was decided in the case of Bourn and Tant *v.* Salmon & Gluckstein, Ltd., in the Chancery Division last week. The basement and part of the ground floor of a house had been leased to the plaintiffs under a lease which contained the clause, "The lessors will from time to time and at all times during the continuance of the said term procure to be paid all rates and taxes payable in respect of the said demised premises." The question was whether the plaintiffs or defendants were liable to pay the amount of the water rate as apportioned to these demised premises, and the Court held that the covenant made the defendants liable. The learned judge intimated, however, that had his decision been unfettered he would have decided otherwise, but he was bound by the decision of a Divisional Court in a case decided on a similar covenant in 1884.

Over-Bridge Tramways.

GENERAL satisfaction must be felt that the Select Committee of the House of Lords have passed for third reading the Bill of the County Council for constructing tramways over Westminster Bridge, along the Victoria Embankment, and over Blackfriars Bridge. Although various objections were brought against the proposal in Committee of the House of Commons, only two opponents appeared before the Select Committee. The frontagers were concerned about possible dangers to pedestrian and vehicular traffic, and thought that prudent finance demanded the postponement of the project; the omnibus proprietors protested against rate-aided competition with private enterprise, and were also concerned about the financial commitments of the County Council. There is something to be said for those who look with alarm upon the increase of municipal enterprise in London, but in the present case the works proposed are of such manifest advantage that the rejection of the Bill would have been almost a calamity. As the Corporation proposal for widening Blackfriars Bridge has also been approved by the Select Committee the circuit scheme of tramways will soon abolish the very inconvenient termini now established in the middle of busy streets at Westminster and Blackfrairs.

"Explosion of the Boilers."

A POPULAR fallacy, originated long ago and sedulously fostered ever since by the daily Press, is that the condensation of steam in a closed vessel causes explosion. For instance, referring to the sinking of a ship at Dover on Sunday last, one of our daily contemporaries says:—"She suddenly plunged and disappeared in a cloud of steam, volumes of water being thrown high into the air by the explosion of the boilers." It really ought to be known, even by newspaper reporters, that a given weight of steam is more bulky than the same weight of hot water. The only possible effect of condensing steam in a boiler is to cause a vacuum, and if the shell of a boiler containing a partial vacuum were not strong enough to resist the external atmospheric pressure the result would be inward collapse. Of course, when water gains access to the furnace of a boiler, as happens in a sinking ship, steam is generated with almost explosive force, and produces the effect which is supposed by the reporters and editors of most daily papers to be due to the explosion of the boilers. The absurdity of the theory must be evident to every schoolboy, and we cannot imagine why the daily Press should continue to make themselves ridiculous by its constant reiteration.

The Electrical Production of Nitrates.

PROFESSOR BIRKELAND'S lecture to the Faraday Society last week on the electrical production of nitrates was of

great interest both to engineers and physicists. In the Birkeland-Eyde process a phenomenon discovered when studying high-tension electric discharges with a view of elaborating the scientific theory of the aurora borealis is utilised. When two copper electrodes connected with a high-tension transformer are placed between the poles of a powerful electro-magnet a brush discharge takes place, forming a large flaming disc at right angles to the axis of the magnet. In order to prevent the electrodes heating excessively they are made of bent copper tubes through which water is kept circulating. Air is driven through this electric brush, and the gases formed, after being cooled and oxidised in reaction chambers, pass through towers containing granite, sandstone, and pieces of quartz, on which the dilute acid condenses. The final cooling tower contains ordinary bricks, over which milk of lime is made to trickle. The gases convert the lime into a compound of calcium nitrate and calcium nitrite. A factory has just been started at Notodden, in Norway, for the manufacture of nitrates by this process, and the results obtained up to the present have justified the calculations made by Professor Birkeland. The electric pressure employed is 5,000 volts alternating, and for each of the three furnaces over 600 horse-power is required. It will be seen that when the factory gets into full working order appreciable quantities of the oxygen and the nitrogen in the surrounding atmosphere will be removed, and it seems to us that a factory of this nature might easily become objectionable. If this Norwegian experiment proves a commercial success, and the lecturer had no misgivings on this point, there is not the slightest doubt that the electrical production of nitrates will soon become a very large industry.

Harcourt House, Cavendish-square.

THIS house, occupying nearly all the west side of the square and abutting at the rear upon Wimpole-street, is now being taken down for the erection of new premises after designs by Messrs. Gilbert & Constanduros. The house, which is named as "Bingley House" in Rocque's survey of 1744-6, was built in 1722-3 for Robert Benson, Lord Bingley, after whose death in 1731 it was purchased by Simon, first Earl of Harcourt, who sold it to the second Duke of Portland. In the King's Drawings at the British Museum is J. Rocque's print of the original design lettered: "as it was drawn by Mr. [probably Thomas] Archer, but built and altered to what it now is by Edward Wilcox, Esquire." Samuel Ware rebuilt the stabling in the earlier half of the XIXth century, with the high wall along what is now the southern portion of Wimpole-street. The front screening wall, having two gates, on the east side, the courtyard, and a general air of seclusion, gave the house an uncommon appearance, which is commented upon in the "New Critical Review of the Public Buildings in London," 1736, when its only neighbours in the square—formerly Oxford-square—were the two wings of red brick at the corners of Harley and Chandos streets, ascribed to E. Shepherd and to James, of the mansion designed in 1720 by John Price, but not completed, for the Duke of Chandos. Harcourt House formed the town mansion of the Dukes of Portland, and was afterwards occupied by the late Marquis of Breadalbane. The lower portions of the structure, now exposed to view, present features which in their details agree with the assumption that Archer was concerned in the designs, being quite after his manner.

The National Portrait Gallery.

THE annual report of the Trustees of the National Portrait Gallery, which was issued last week, should be noted on account of the point made by the trustees that the Gallery needs to be enlarged. They state that without further accommodation the collection cannot be properly arranged, and that it is useless to make additions to the pictures already possessed by them. It is certainly unfortunate that a comparatively new gallery should so soon require extension. The trustees appear to cast longing eyes at the site now occupied by the St. George's Barracks, but there seems to be no chance at present of this ground becoming available. It may perhaps be as well if, in the meantime, the trustees would consider the principles on which portraits should be admitted and retained. Judges, for example, though useful officials, are not as a class persons whose portraits should be admitted, and we are inclined to think that some of the difficulty as to space might for the present be got over by a review of the portraits now in the Gallery. It might also be possible to place a larger number in provincial museums—even temporarily.

The Fine Art Society.

AT the Fine Art Society there is a most interesting collection of paintings, studies and etchings by Mr. William Strang. Among the paintings is the one, now called "The Sea Pool" (11), which was before exhibited under some other title at Messrs. Agnew's Gallery, the Titianesque quality of which came as such a surprise to those who had only previously known this artist by his etchings, which varied between the grotesque and the pathetic. "The Dancers" (14) is another picture of the same class, not so fine in composition; "Girls Bathing" (20) is another which is masterly in composition and colour. The studies and etchings show how Mr. Strang has been trying the styles of different artists; his portrait of Judge Stephen, of Calcutta (4), is like a recollection of Holbein; the small picture called "The Creation" (34) recalls Blake; and the etching entitled "The Boatman" (42) might have been done by M. Legros. But in spite of these reminiscences, the steps of an artist feeling his way, there is plenty of absolute originality; and many of the etchings are exceedingly fine in their concentrated force of expression, composition, and lighting; we may mention especially "Woman Darning" (39); "The Greengrocer's Shop" (45); "Evening" (59), the two seated figures by the fire, which carries in it indeed a suggestion of Israels; "The Story" (63); "The Traveller" (67) and the "Man with a Cloak" (88), two admirable studies of figures; and the curious and fanciful composition "The Cat" (100), where a nude figure with her back to the spectator contemplates a large model or *maquette* of a cat. In the adjoining room at the same Gallery is a collection of water-colours, chiefly garden scenes, by Miss Kate M. Wyatt (a relation of the late Sir Digby Wyatt) which are notable for their freedom of style, fine colour, and sense of light. "Azaleas and Dwarf Gorse" (10) is an admirable study in colour; another remarkable in the same sense is "The Lavender Garden, Knole" (17); but besides these foreground studies there are many, such as "The Terrace Border, Brownsea" (11); "The Terrace, Albury" (18); "The Yews, Hutton John" (24); "The Bowling Green, Wrest" (30), which are delightful garden landscapes; while a very successful little picture of "A Sunset Gleam, Honfleur" (46), with the ships and harbour in the foreground, show that the artist's talents are not confined to one class of subject.

Sketches by Sir William Eden.

AT the Dutch Gallery in Grafton-street is a collection of "Water-colour Drawings by Sir William Eden, Bart.," which are in fact no more than sketches, sometimes very slight, but have the interest belonging to the work of an amateur who can see effects of colour and composition truly and record them effectively. "The Old Market Place, Milan" (2) is an excellent memorandum of colour and character in a city scene; "Villa d'Este, Tivoli" (11), is seen in profile against a glowing evening radiance given with remarkable clearness of effect; "Harrogate" is a sketch showing a very fine sky; "Wemmergill, Yorkshire" (31), and "Amersham" (44) are good sketches; while a delicately executed representation of "An Oriental Vase" (20) and a portrait (if one can call it so) of "Lady Eden" (39) seated with her back to the spectator, show that the artist's talents are not confined to landscape sketching.

NOTES ON OLD LONDON.

(Concluded from last week.)

St. Paul's Church.—An Act of 1660 erected the precinct of Covent Garden into a parish taken almost entirely out of that of St. Martin-in-the-Fields. After the fire on September 17, 1795, T. Hardwick restored the church; he displaced Inigo Jones's bell turret for a cupola, rebuilt, of stone, the two rustic east gateways of brick and plaster, and removed the stucco of 1788. In his print of "Rich's Glory" Hogarth draws a flight of steps between only the two inner columns of the portico. Authoritative drawings, for instance, those by Hollar; John Sellar; Colin Campbell, a full set to scale; T. Malton, 1774; J. Maurer and A. Pugin's plan of November 1, 1823, evince that the portico rested upon a stylobate ascended by steps cut in its north, east, and south projecting portions. The removal of the platform renders the floor level with the footpath: that was done, we gather, in 1872, when Butterfield made some rearrangements. The railings were taken away from around the portico in 1879, a manifest improvement; the two bells hang in the west pediment, Hardwick's cupola having been taken down in fear that it might endanger the roof. Over the altar is a composition with two angels, by T. Banks, R.A. The graveyard has been levelled and replanted.

Floral Hall.—Gye projected a "floral arcade" for London florists. Opened with a Volunteer ball on March 7, 1860, it served its intended purpose for a few months, and was then used for concerts and exhibitions. The plan is L-shaped; E. M. Barry's design is a signal advance beyond most structures after

that kind [February 11, 1860, with details of the iron front, and block plan]. The dome, rising to 90 ft., has a span of 50 ft., the main body is 225 ft. by 75 ft.; the basement, now converted for storage, is 16 ft. high. C. & T. Lucas were the general contractors, and H. Grissell for the iron and glass. In the spring, 1888, the Duke of Bedford bought the hall as an adjunct to the fruit market. The south wall, of red brick, was dressed with stone and pierced with new doorways. Though the line of Great Piazza is continued in the iron arcade, the juxtaposition of the two presents an incongruous effect.

Orford House, next west to Great Piazza, was built in or about 1716 for Edward, grandson of Francis, fourth Earl of Bedford, who, for his victory over De Tourville's fleet near Cape La Hogue, 1692, was created Earl of Orford, May 7, 1697. It displaced a house that had been occupied by many notable people—Sir William Alexander of Menstrie, the Scots poet and statesman and friend of Henry, Prince of Wales; Tom Killigrew; Denzell, Lord Holles; Sir Harry Vane, who, says Aubrey, had his laboratory there; and Nathaniel, Lord Crewe, Bishop of Durham, at whose door they laid the parish foundlings. The fanciful resemblance of the red-brick Dutch façade to the stern of a man-of-war is diminished by the removal of the lofty frontal. Admiral Russell used timbers of his flagship *Britannia* at La Hogue for the finely-carved main stairs and other portions of the fabric. Lord Orford (*ob.* 1727 *s.p.*) devised the house to Thomas Archer, created Baron Archer in 1747, who lived there until 1758. Hogarth portrays Lady Archer in his picture of Covent Garden. Andrew, second and last Lord Archer, married Sarah, daughter of James West, P.R.S., the bibliographer, who went into residence there. Two years after West's death, in 1772, David Lowe opened the house as a family hotel—the *hotel garni* of Walpole, and it seems the first hotel after that kind in this quarter. "The Grand Hotel" appears on its front in T. Malton's aquatint of 1796; there is another good view by Sutton Nicholls of about 1725. W. C. Evans, of Covent Garden Theatre, leased the hotel which, as "Evans's," became a favourite resort. To him succeeded, in 1844, John, or "Paddy," Green, who managed the business during nearly thirty years. The Institute met at Evans's when first established under the presidency of Earl de Grey (1835-59). W. Finch Hill built over the garden the large supper and music room [December 22, 1855], 72 ft. long, making with the old room a music-hall 113 ft. by 56 ft., divided by columns of Bath stone having wreathed Ionic capitals into a nave and two aisles. It is the "Bivins's Harmonic Cave" of Thackeray; yet some question whether "Evans's" or the "Cyder Cellars" in Maiden-lane is the Cave of Harmony" wherein Colonel Newcome sang "Wapping Old Stairs" as he learned it from Incledon. The house has latterly been occupied by the Savage, Vauxhall, Falstaff (1882) New (1883), and other clubs. The effects, theatre, etc., of Evans's Club were sold at auction on June 17-19, 1890; John Fleming opened the National Sporting Club there on March 5, 1891. For the Falstaff Club Albert Calcott decorated the (old) billiard-room upstairs with a set of paintings of the homes of characters in the "Merry Wives of Windsor."

Bedford House, Tavistock-row, and Tavistock-street.—After the attainder of Protector Somerset, the Crown granted, in May, 1552, to John Russell, first Earl of Bedford of that house, the conventual home farm or garden, together with the Elms Close, or Seven Acres, lying to the north through which ran a by-way, cited in 1612—the later Long-acre. Either the Earl John, or his son Francis, built in the Strand (Southampton-street), and opposite their former home the Bishop of Carlisle's "inn," what Strype describes as:—

> "a large but old-built house, having a great yard before it for the reception of coaches, with a spacious garden, having a terrace-walk adjoining to the brick wall next the garden."

The front yard was entered from the Strand. The garden wall to the north became the southern wall of Covent Garden. Two plans, one of about 1680, the other of 1690, plot Bedford House (constructed mainly of wood) as extending from the Strand to the southern side of Maiden-lane. To the north lies the house garden, with a smaller garden eastwards. The entire garden blocks the eastern end of Maiden-lane, and on the east side it is separated from the stables by a passage—since Tavistock-court. The stables are entered in the south-western corner by a way, leading from the courtyard, now represented by Tavistock-street; there are two stable gates facing northwards at what was then the elbow of York and Charles streets. Charles-street is now absorbed in Wellington-street, passing over the site of the gateway and portion of the stable-yard. The court-yard has another approach from the end of Exeter-street (Denmark-court). In the plan of 1690 the garden walls have three rounded bastions, whereof two turn out of the northern wall and the other turns westwards behind Maiden-lane. After the demolition of Bedford House in 1704, Tavistock-row, which is shown in Canaletti's picture cited above, supplanted the long wall to the north, and has in its turn succumbed. In December, 1885, was dismantled the last remaining house, No. 13, where lodged Zincke, the famous enameller and miniature painter, Nathaniel Dance, and Dr. Wolcott, who there, in a garret, began his literary career as "Peter Pindar." At No. 4, north-west corner of Tavistock-court [April 15, 1876] Charles Macklin, the veteran of the stage, whom Murphy happily named the black-letter copy of Macbeth, passed the close of his long life, and in that house Lord Sandwich, after purchasing some neckcloths, first saw Miss Reay, who had served her apprenticeship at a mantua-maker's in St. George's-court (since Albion-place), St. John's-lane, Clerkenwell. In No. 5 lived and died (1707) William Vandervelde the younger, and Thomas Major, engraver to the Court and the Stamp Office, who, in 1784, furnished in twenty hours a perfect substitute in brass of the Great Seal stolen from Lord Chancellor Thurlow's in Great Ormond-street.

Covent Garden Theatre and Royal Opera House.—The annals of the stage are silent about any theatre in Covent Garden before Rich went thither from the Duke's Theatre in Lincoln's Inn-fields. A ticket, inscribed "for the Musick at the play house in Covent Garden, Tuesday, March the 6th, 1704," relates doubtlessly to that in Drury-lane. A fire on the morning of September 20, 1808, destroyed the Shakespeare Tavern and Apollo room in the angle of the two Piazzas, some adjoining property, and the theatre which Edward Shepherd built for John Rich, who opened the house on December 12, 1732. The auditorium, 55 ft. deep, and the stage stood north and south. Handel's "Messiah" was performed there in 1741, and on March 28, 1800, Haydn's "Creation," for the first time in London. The Ionic doorway (see T. Malton's aquatint of 1796) in Great Piazza gave access to the auditorium; at the north end of Little Piazza remained until lately the older and smaller door where, on April 7, 1779, Hackman shot Miss Reay whilst awaiting her coach after the play of "Love in a Village." Holland made some alterations in 1794; in 1803 Cresswell and Phillips greatly improved the auditorium, adding sixteen private boxes entered from Bow-street, where also was the pit door; see the water-colour drawings by W. Jones and T. H. Shepherd, 1808, in the Crace Collection. The theatre, rebuilt by Sir Robert Smirke, R.A. (see lithograph), assisted by C. R. Cockerell and John Newman, was opened with "Macbeth" on September 18, 1809, by John Kemble, whose new scale of prices occasioned the "O.P." disturbances that lasted ten weeks before the public gained a victory. The insulated house occupied an area larger than that of any contemporary theatre in Europe. The frontages to Bow and Hart streets extended, over all, to 220 ft. and 178 ft.—the actual building, the portico excepted, being 209 ft. 3 in. by 166 ft. 4 in. (*Builder*, March 22, 1856). The structure presented an example of an early use of cement for an important public building, and the tetrastyle portico one of the first specimens of the revival of the Grecian Doric mode. Flaxman's and Rossi's statues of the Tragic and Comic Muses, with Flaxman's bas-reliefs of the ancient and modern drama adorn the later building. The auditorium, to the south, for 2,800 persons, measured 51 ft. by 52 ft. 9 in., the stage to the north was 68 ft. deep, and 82ft. 6 in. wide from wall to wall, the proscenium extending 38 ft. 8 in. between the pilasters. The Anti-Corn Law League rented the house in 1843-5, and Messrs. Grieve fitted the interior as a Tudor Hall for the bazaar. In December, 1846, Albano began a thorough reconstruction of the interior [April 10, 1847], expending 40,000*l.* in all, and on April 6, 1847, the house was reopened for Italian Opera with "Semiramide," Sir Michael Costa being musical director. There Jullien gave his popular promenade concerts, and Grisi took her farewell on August 7, 1854. At the close of a masquerade ball given by Anderson, the conjuror, a fire, on Wednesday morning, March 5, 1856, caused damage computed at 250,000*l.*; Queen Victoria went to see the ruins. E. M. Barry (*ob.* 1880), the architect of the new house, planned the auditorium and stage to the east and west; Frederick Gye opened the season with "Les Huguenots" on May 15, 1858. The whole height from the floor of the pit-tier boxes to the crown of the ceiling was 61 ft.; below that level the lower basement floor beneath the pit and stage descended to 23 ft. The whole height from the bottom of the footings to the lower flange of the roof-girders—themselves 9 ft. more—was upwards of 85 ft. The highest portion of the walls at the west end rose to 93 ft. from the street, and 109 ft. from the basement floor. The roof, on iron trellis girders, had a ridge-and-furrow covering. The interior dimensions were:—From curtain to front of central box, 81 ft.; width between boxes, 63 ft.; proscenium opening, 50 ft. wide by 43 ft. high; stage, 60 ft. deep from curtain-line and 90 ft. wide between the walls. C. & T. Lucas were the general contractors, and H. & M. D. Grissell sub-contractors for the ironwork [October 24, 1857, east front; April 2 and 16, 1859, interior, plan, on grand-tier level, and section]. In 1893 Mr. Pilditch altered the gallery and basement and carried out some structural improvements to protect the auditorium and dressing-rooms from fire by means of concrete floors and ceilings and iron doors. In January-March, 1899, the Grand Opera Syndicate, sub-tenants, took over the forty-six years' remainder of the lease held directly from the Duke of Bedford, and engaged Mr. Edwin O. Sachs as their technical adviser for extensive improvements, including sanitary rearrangements, installation (by Mr. Wingfield-Bowles) of electrical light in four colours; a large "wing" store, redecorations, and so on. Mr. Sachs followed those alterations with a complete modernisation of the whole house and stage; all the works are fully described in the *Builder* of June 6, 1899; May 4 and June 1, 1901 (with plans of the house and stage and a section); and May 24, 1902; Messrs. Colls & Son being general contractors.

Bow-street.—In the days of Dryden, Wycherley, Congreve, and the *Spectator* Covent Garden and Bow-street (1637) were the St. James's-square and Bond-street of that part of the town.

> "I've had to-day a dozen Billet doux
> From Pope and Wits, and Cits, and Bow-street Beaux;
> Some from Whitehall, but from the Temple more:
> A Covent Garden porter brought me four."

Thus Mrs. Bracegirdle, in reciting at Drury-lane Theatre Dryden's epilogue to "King Arthur." The upper end of the once crooked street, which ceased to be a fashionable quarter in about 1725, terminated in a *cul-de-sac* abutting against Long-acre a few yards east from Phœnix-alley, since Hanover-court. The widening of the later narrow Bow-court formed part of Chawner and Pennethorne's improvement for Endell-street and Long-acre—see *Builder*, July 2, 1904, with plan. On the west side were the pit, and, after 1803, the box entrances into Rich's Theatre, for which was pulled down the house inhabited by Dr. Radcliffe at the time of the memorable dispute about his garden door with Sir Godfrey Kneller in Little Piazza. In the next house, south, Waller's home during two years, was established the police-court, with three magistrates in 1749—confer Sir Patrick Colquhoun's "Treatise on the Police of the Metropolis. By a Magistrate": third edition, 1796. Sir John Fielding, the first presiding magistrate, lived in the house, as did his half-

brother and fellow-justice, who there finished his "History of Tom Jones, a Foundling," and wrote "Amelia," 1749-51. The "No Popery" rioters sacked the house on Tuesday, June 6, 1780. Its successor, constructed of red brick, could be identified in our time by its stuccoed front, rising one floor above its neighbours, the railings before Nos. 3, 4, and 4A having terminals in shape of Roman fasces, and by the high-pitched gable at the rear. The police-court and cells to the south were on the ground floor at the back. The house, Nos. 4 and 4A, was, with Nos. 3 and 5, taken down in the winter 1887-8 for the foreign flower market. Opposite, in the early years of the century, stood the Old Brown Bear, which, having served as the police-station until the completion of the new court and offices, was adapted for constables' lodgings. A metal plate on the wall of one of the women's cells marked the boundary of St. Paul's and St. Martin-in-the-Fields' parishes. When the lease expired ten years ago quarters for unmarried men were established in Clark's-buildings, High-street, St. Giles. The old station, on the Bedford estate, is now the Opera Hotel, having two columns in the doorway. The old court and station were the cradle of the Metropolitan force; the detective department originated in the Bow-street "runners," of whom Townsend was the chief. Sir Robert Peel's Act, 10 George IV., c. 44, superseded Sir John Fielding's horse patrol, the Bow-street foot patrol, and all the parochial watch and police outside the City. V. G. Dowling, editor of *Bell's Life in London*, claimed to have initiated the present system of a force which derives from the night watch established in 1253. For the new police-court and station [Sir John Taylor, June 21, 1879, drawing and plans], opened in 1881, and enlarged in 1902, were taken down Duke's-court at No. 27, and Nos. 22-30 between Broad and Martlett courts. The buildings, which afford sleeping accommodation for 100 men, cost about 40,000*l.*, Messrs. Geo. Smith & Co. being the contractors. The site was leased from the Duke of Bedford for ninety-nine years at a ground rent of 1,300*l.* per annum. Broad-court is almost entirely rebuilt; Martlett-court, formerly Martlett's-row, has lately been cleared for a footway into Drury-lane, and with it the homes of John Mills, comedian (*ob.* 1736); Thos. Hull (*ob.* 1808), founder of the Theatrical Fund, and an actor at Covent Garden during forty-eight years; Shuter, actor, at No. 2, in 1756; Suett, the very personification of fatuous whimsicality and whose laugh was a peal of giggles; Thomas Dibdin; O'Keefe, dramatist, in or about 1780; and, it is said, Harriet Mellon, who married Thomas Coutts. No. 20, the London, City, and Midland Bank, and the adjoining block in Broad-court, are by Mr. R. Selden Wornum, 1897. In 1848 H. Roberts (*ob.* 1876) enlarged and improved the Scottish National Church [July 8, 1843], by R. Wallace, 1842, in Crown-court, after the Norman style, with two outside flights of stone steps, and built the adjoining schools. Tavistock Chapel, now St. John's Church in Broad-court, was remodelled by Butterfield in 1855-6, and altered and repaired by Messrs. M. Hills & Son in 1894; the stained glass of "The Majesty" above the altar is by Wailes.

Theatre Royal, Drury-lane.—The wittiest volume of parodies in our tongue keeps alive the memory of an eventful day in the story of Drury-lane Theatre:—

> "Sobriety cease to be sober,
> Cease labour to dig and to delve;
> All hail to this tenth of October,
> One thousand eight hundred and twelve."

On that day Sheridan opened, with a prologue by Lord Byron, the house built by B. Dean Wyatt to replace that by Holland (*ob.* 1806) (see lithograph). The conflagration in the night of February 24-5, 1809, was visible from afar; in the Guildhall Art Gallery is A. Pether's view of the theatre in flames as seen from Battersea Bridge. There had been no play that evening; Sheridan was in the House of Commons, and opposed, upon public grounds, a motion for adjournment; Kelly, acting-manager, says he remained at his post, thus falsifying the story that Sheridan was drinking at the Harp in (Little) Russell-street, and, on being told a fire had broken out, replied that surely a man might take a glass of wine by his own fireside. Holland's Theatre, opened on March 12, 1794, succeeded the King's House in the Riding-yard, so often mentioned by Pepys, latterly known as the Theatre Royal—in Brydges-street, Covent Garden, and pulled down in 1791, which Wren had rebuilt in 1673-4, after the fire in January, 1672, that consumed sixty houses besides. Adam added the west front in Brydges-street in 1775; Gwyn's plan shows that in Garrick's time the theatre stood where is the present auditorium. At the two corners, north and south, were the Rose and Windmill taverns: "supper and friends expect me at the Rose." Holland's theatre, on a site 320 ft. east to west, by 155 ft. north to south, had 3,611 seats, including 800 in a pit 54 ft. by 46 ft.; the stage measured 105 ft. deep by 75 ft. A colonnade screened part of the north side; the design remained unfinished at the time of the fire when the fabric had already cost 200,000*l.* The allusions to Samuel Whitbread, M.P., in "Rejected Addresses" are explained by the fact that he played a leading share in reinstating the renters' affairs. Wyatt based his plan upon that of the theatre at Bordeaux, famed for its acoustical properties. His main building measured 131 ft., north to south, by 237 ft., east to west, the scene-rooms, etc., extending 93 ft. further. Wyatt planned the staircases and landings with space enough for nearly as many, 3,060, as could collect in the auditorium. The tender for 112,750*l.* by Henry Rowles, was, it is said, one of the first *bonâ-fide* contracts made in London; other expenses for fittings, etc., amounted to 13,040*l.*; see the *Builder*, with Hodson's letter, September-October, 1855. Either James Spiller or Soane added the portico in 1820, and S. Beazley the colonnade of hollow iron Ionic pillars in 1831. In 1822 Beazley remodelled the interior; altering it from a three-quarter circle having a diameter of 58 ft. across the pit between the breast-work of the dress boxes, to a nearly horseshoe form measuring 48 ft. from the stage to the dress boxes by 46 ft. 6 in. at the two ends; the stage being 96 ft. to the back wall by 77 ft. 5 in. between the walls [October 2, 1847; interior as redecorated for F. Gye]. The proprietors pulled down four houses in Marquis-court for an addition, by Phipps, to the east buildings in 1884; at that time Sir Augustus Harris, lessee, paid a rent of 6,000*l.* per annum, plus 10*l.* for every performance after 200; the Duke of Bedford taking 1,355*l.* as ground rent under the lease of seventy-five and a quarter years from September 29, 1819, and the new renters' trustees 3,100*l.* per annum. The patent of April 25, 1662, empowered Killigrew, his heirs, etc., to erect without limit of time:—

> "One theatre . . . in any place within the cities of London and Westminster or the suburbs thereof to be assigned and allotted out by the surveyor of our works."

In 1893 the Duke of Bedford declined to renew the lease in view of a contemplated extension of the market, and stated, further, that, as he was only tenant for life, he felt unable to grant a short lease except at a rack rent. On November 11, 1897, the renters and debenture holders closed their accounts and agreed to a final dividend of 4*l.* 9*s.* on 293 subsisting shares. In 1897-1901 Messrs. Campbell Smith & Co. carried out Mr. P. E. Pilditch's scheme of redecoration within and without; the structural works by Mr. Pilditch comprised new exits, a new system of ventilation, reinstallation of electrical light suply in two alternative services, reconstruction of the grand and first circles of fire-proof materials, and the erection of workshops, stores, ballet-rooms, etc., with a block of shops and residential flats in Drury-lane to the south and east. On March 26, 1904, this journal printed a list of the London County Council's 143 requirements for, mainly, the protection of the audience and company from fire. H.M.'s Office of Works nominated Mr. John Slater as arbitrator between the parties; in the result Mr. Pilditch was appointed to carry out a large number of structural alterations at a cost of nearly 25,000*l.* At the north-west angle, where stood the Rose, is the Harris Memorial, 1897, a drinking fountain designed by Mr. Sidney R. J. Smith, with a bronze bust by Mr. T. Brock, R.A.

Drury-lane.—In 1877 the late Metropolitan Board of Works applied to Drury-lane the provisions of the Artisans' and Labourers' Dwellings and Improvement Act, 1875. They obtained statutory powers in respect of nearly all the area between Great Queen-street, Great Wild-street, Prince's, renamed Kemble, street, and Drury-lane. The condemned quarter was traversed from Drury-lane to Great Wild-street (1651) by Lincoln-court, formerly Stewart's-rents, and previously Holford-court; Brewer's-court; Wild-passage; Orange-court, where typhoid fever broke out in the autumn of 1879; Pit-place or Cockpit-alley, site of the Cockpit or Phœnix Theatre; and Princes-court. Orange-court was barely 5 ft. wide, the two entrances were narrower; the upper stories in the courts and alleys leaned forward; the all-pervading poverty, dirt, and disease were unrelieved by even the few touches of gaiety and brightness that characterised the Rue de Calandre and similar purlieus of the old Cité of Paris described by Eugène Sue. The Peabody-buildings, erected there in 1880-1, occupy the western confines of Oldwick Close or Aldwych Field owned by Sir Henry Drury and Harry Holford, *temp.* Elizabeth, and since by Humphrey Weld, who built Great Wild-street and nearly all the houses between that street and Drury-lane in and about 1651 [November 18, 1854, Wild-court]. The Housing of the Working Classes Act, 1903, requires rehousing accommodation to be provided where thirty of that class are displaced under any Bill in the County of London; before that Act the limit below which rehousing was not required was twenty houses in any metropolitan borough. On October 15, 1895, the London County Council resolved to clear the insanitary areas between (*a*) Drury-lane, Stanhope-street, Blackmore-street, and Kemble-street; (*b*) Clare-street, Clare Market, Houghton-street, and Stanhope-street; and (*c*) White Hart-street, the Strand, Drury-lane, Drury-court, and Helmet-court (Fig. 1), wherein the death rate had reached nearly forty in 1,000, the population being 3,038. They, for rehousing purposes, amalgamated that scheme with the measure for the new thoroughfare to High Holborn. For some of the 3,700 ultimately dispossessed, they provided homes on the Duke's-court and Marquis-court sites, and in Kemble-street House, a lodging-house for 610, at the corner of Drury-lane; in October, 1898, they agreed to buy land from the Duke of Bedford for 118,740*l.* for the three blocks of Sheridan, Beaumont, and Fletcher buildings on the west side of Drury-lane to the north of Russell-street. The "property" and store rooms added to the theatre in 1884 absorbed Vinegar-yard garden within the curved wall, and the pit door of Wren's house facing Cross-court. In "My First Play" Charles Lamb writes:—

> "At the north end of Cross-court there yet stands a portal, of some architectural pretensions, though reduced to humble use, serving at present for an entrance to a printing office. This old doorway, if you are young, reader, you may not know was the identical pit entrance to old Drury—Garrick's Drury—all of it that is left."

On the north wall, east end, of Marquis-court, pulled down in December, 1894, was a well-designed stone tablet inscribed "Marquis Court, 1763." The court derived its name from the Marquis of Granby public-house, adapted in 1885 for a working-boys' home. In Vinegar-yard, mentioned in "Roderick Random," "The Memoirs of Mr. C. J. Yellowplush," etc., a corruption, probably, as in St. Giles-in-the-Fields, Aldgate, and Bermondsey, of Vinegarden-yard (1621), was the home, in her girlhood, of Fanny Barton, Mrs. Abington, successor to the comic muse of Mrs. Pritchard and Kitty Clive, and unrivalled as Lady Teazle and Miss Prue: Lockie's "Topography of London," 1817, calls it Vine-yard. A plan of 1700 plots the Windmill Tavern at the north-western corner; at the south-western corner stood the Whistling Oyster. In the first-floor room of the Crown, opposite Lady Burdett-Coutts's box-door, the first contributors to *Punch* met for the weekly dinner, the room was afterwards used by the Reunion Club, and, in 1857, by the Savage Club; the (old) Eccentrics Club migrated from Chandos-street to the Crown. The west portion—named "Little Bridge [Brydges] street" in Gwyn's plan of 1766, and "Wooburn-street" in Horwood's survey of 1799—was closed in 1890, and covered over for a pit and gallery entrance to the theatre

in November, 1898, affording shelter for playgoers who have lately adopted the *queue* system. Between Vinegar-yard and Russell-court, and overlooked by the *Builder* offices, lay the long-neglected burial ground, 112 ft. by 40 ft., of St. Mary-le-Strand, converted by the Metropolitan Public Gardens Association into a playground, 1886. A faculty of July, 1897, provided for the reinterment of all human remains at Woking, and the London County Council, who had taken over the maintenance of the playground seven years previously, arranged with the Duke of Bedford and his trustees to throw the area, together with Russell-court, into new York-street, paying in compensation 500*l.* to the Association, and 2,500*l.* to the vestry and rector of St. Mary's. The iron-barred gate at the end of the covered passage—"a reeking little tunnel of a court"—from Russell-court, the stone step, and other details contribute to the identification of the graveyard with that of which Charles Dickens writes so gruesome an account in "Bleak House," whither Jo conducts Lady Dedlock to see Hawdon's grave.

SOME NOTABILIA.

Strand.—C. Forster Hayward's plan for new street to High Holborn [November 18, 1882]; proposed widening by the Strand Improvement Association, H. W. Brewer's bird's-eye view [December 25, 1885]; plans for improvement, Mr Nevill [April 20, 1889], Mr. T. G. Jackson [April 27, 1889], and Mr. Cawston [February 15, 1890]. The Cross, and after it the Maypole, opposite a point midway between Drury and Windsor courts; John Clarges's maypole, renewed in 1713, given by Newton 1718 to Dr. Pound for his telescope in Wanstead Park; first hackney-coach stand to west of the maypole, 1634. *St. Mary's:* Parapets and vases repaired 1878—Butterfield; all stone-work restored 1889—Mr. J. M. Anderson; drawing of steeple [July 28, 1888] by Mr. T. J. Kitchlee from his and Mr. J. Hutchings's measured drawings; view from north-east, across the cleared ground [April 9, 1904]—Mr. A. C. Conrade; 352 [June 28, 1902]—Mr. T. E. Collcutt: 323-4, Coach and Horses, rebuilt 1888-9—Mr. W. T. Farthing; 321 [February 27, 1885], for Mrs. S. S. Torrie—T. E. Knightley. *Lyon's Inn:* The hall (1700), Ireland's print, 1800; Architectural Association, 1845, Professor Kerr, first president; the sign of a carved lion from Holywell-street to Guildhall Museum, 1888. *St. Clement Danes:* Complete restoration of interior and exterior, 1897-8, by H. Currey; pews lowered, two lower windows in apse opened out, aisle-groining and arched ceiling and spandrels of vaulting cleaned and coloured by Mr. H. G. Liley, stained glass in five apse-windows by Messrs. Burlison & Grylls; organ, by Father Smith, rebuilt 1856 by Robson; tablet, 1851, in Dr. Johnson's pew in north gallery, east end; glass now in the three upper windows in north wall by Collins, 1844; two wooden gates at west door designed by Street for another church (see also *Builder*, August 6, 1898); view from north-west across cleared ground [February 20, 1904]—Mr. A. C. Conrade; 413 and 415, two old houses, at Heathcock-court.

Bedford-street.—Post Office—Jas. Williams (*ob.* 1892); C.S. Stores—Lockwood & Mawson [August 18, 1877]. *Exeter-street:* Dr. Johnson first lodged in London at Norris a staymaker's, 1737. *Lyceum Theatre:* Society of Beefsteaks, Dr. Johnson, Isaac Ware, and John Webb, members; Balfe's English opera opened, 1841; Charles Mathews the younger and Mme. Vestris, 1847-56; Mme. Ristori, 1856; Fechter, 1862-6. *Wellington-street:* 24, John Noseda, printseller, 1865. *Catherine-street:* Editors of the *Builder*, J. A. Hansom (*ob.* June 29, 1882) took out patent for the cab, 1836, brought out the first number on December 31, 1842; A. Bartholomew, F.S.A. (*ob.* January 2, 1845); George Godwin, F.R.S. (*ob.* January 27, 1888), retired October, 1883; Mr. H. Heathcote Statham: "A Retrospect, Vol. I. of the *Builder*," April 16, 1904.

Covent Garden.—Hart, originally Elm, since December, 1895, Floral-street. Piazza: Langford's, formerly Cock's, afterwards Robins's auction rooms; the second Beefsteak Club at Langford's; ground-plot, with Bedford House, about 1690, from a drawing *penes* J. C. Crowle, copiously annotated, Smith's "Westminster," 1807; Winston's water-colour, 1808, and lithograph after W. Daniell, A.R.A., 1809, of front, Covent Garden Theatre, Crace Collection.

Garrick-street.—With subway, by the late Metropolitan Board of Works, 1863-4, at a net cost of 34,140*l.*; Garrick Club-house—F. W. Marrable. *King-street:* 35 (altered as a bank), the Garrick Club, "the G., the little G., the dearest place in the world" of Thackeray (*ob.* December 24, 1863); Westminster Insurance Office, 1857—T. Little, on site of Speaker Lenthall's house; Clarissa sought refuge from Lovelace "at Mr. Smith's, a glove-shop in King-street, Covent Garden." *Long Acre:* 137, Bryden, 1682-6, the last that survived of his homes in London, taken down a few months ago; 12-14, for Mr. E. Stanford—Messrs. Read & Macdonald, in the rear, between Rose-street and Conduit-court, were the house and stone-yard of Nicholas Stone, master mason to James I. and Charles I. and two of his sons until 1660; see a survey of Elm Close, 1650, and Vertue's note in the Stone MS. "Account of Works," Soane Museum; St. Martin's Hall [November 26, 1853]—W. Westmacott, for John Hullah's singing schools (1841), from Exeter Hall, after a fire on August 26, 1860, converted for Alfred Wigan into the Queen's Theatre for an audience of 2,200—C. J. Phipps; opened as a gymnasium, June 7, 1888, by the National Physical Recreation Society; the Mercers' Company's estate of 10 acres, once known as Elm-field, or Close, bounded by St. Martin's lane, Castle-street, Drury-lane, and the north side of Long-acre, is all they have retained of Dame Joan Bradbury's devise, 1529, of 120 acres in St. Giles and St. Martin, and 29 acres in St. Marylebone parishes; the Company's cognisance of a demi-virgin, crowned, issuing from an orle of clouds, at 139, 140, and 142, has been mistaken for Joan.

Tavistock-street.—North side pulled down in 1887, and a market-house built at east end on the site of Bedford House stables and 1-3, Tavistock-row; Strand Board of Guardians' Offices—R. Walker (*ob.* 1896).

Henrietta-street (1637).—At Rawthmell's coffee-house Dr. Mead, and Society of Arts established 1754; St. Peter's Hospital, 1882—J. M. Brydon (*ob.* 1901); Woburn-chambers [February 19, 1858]—C. Gray; London and County Bank, 1839—Mr. A. Williams.

Maiden-lane.—Turner, R.A., until 1800, at his father's house, 26, on the north side, at the west corner of Hand-court, two drawings in Archer's "Vestiges," pulled down, 1861; John Ireland; 20, Cider Cellars, haunt of Chatterton and Porson; Andrew Marvell; Voltaire at the White Peruque; Corpus Christi Church, memorial to Cardinal Manning—Mr. P. Fitzgerald.

York-street.—Samuel Baker, 1744, founded Sotheby's, removed 1804 to 141 (now 140), Strand, in 1818 to 3 (now 13), Wellington-street; tablet "1636" at 4-5, H. G. Bohn (*ob.* 1884) started at 4 as a second-hand bookseller; 6, Bell & Daldy; street extended eastwards to Drury-lane, 1889-90; Siddons and Stirling buildings for 390 in eighty tenements—Mr. W. E. Riley. (*Great*) *Russell-street* (1634): Sir Edmund Verney leased, at 150*l.* per annum, the two houses north and south, east end, the ordinary rooms had only shutters, but there were fixed locks on the doors, a "latest improvement" in that day—see "Memoirs of the Verney Family," 1892; 17, Tom's, closed in 1814, rebuilt in 1865, relics sold at Sotheby's, July 3, 1899, see *Builder*, August 9, 1899; 17, Till, medallist; 9, Sir William Chambers, Mrs. Inchbald; 9, Button's, the lion's head there, 1713-31, then taken to Shakespeare tavern, Great Piazza, bought for 17*l.* 10*s.* on November 8, 1804, by Richardson, of Covent Garden, whose son sold it to the Duke of Bedford; 8, lately the Caledonian coffee-house, Tom Davies there introduced Boswell to Johnson, May 16, 1765; 7, taken down June, 1905, Thomas Grignion, watchmaker, 1710, his brother Charles, line engraver, and his son Charles, portrait painter; 20, Charles and Mary Lamb, 1817-23; 21, Wills's. *Russell-street* (east): The Albion, closed October, 1895, pulled down 1902, and the Harp, haunts of actors, etc.

Drury-lane.—Cock and Magpie, opposite Craven-buildings [December 13, 1890]; Cornwallis House, Sir Lewis Lewkenor, *temp.* James I., taken down 1807 for widening north end; St. Martin-in-the-Fields burial ground laid out by the Metropolitan Public Gardens Association, 1877, opened as a playground with gymnasium 1890, 141-4, for Messrs. Lambert & Butler—C. F. Hayward (*ob.* 1905); St. Mary-le-Strand hall and library, 1892—Mr. A. Vicars; 88-91, for Messrs. Hart, Son, Peard, & Co., 1892—Mr. R. F. Russell; schools in Macklin-street—J. J. Scoles (*ob.* 1863). Streets renamed: Betterton (*vice* Brownlow), Goldsmith (Coal-yard), Macklin (Charles, formerly Lewkenor's-lane), Shelton (King), and Kemble (Princes). Pulled down since 1865: 1-15, Wych-street to Short's-gardens; 47-54, with Duke's-court; 124-40, for Peabody-buildings; 65-123, with White Hart-street, Craven-buildings, Craven-yard, Blackmoor-street, Clare-court, and White Horse-yard; and Drury-court. *Vinegar-yard:* At the Dove, John Sympson engraved many of Hogarth's pictures.

LETTER FROM PARIS.

THE Municipal Council purchase every year, out of the two Salons, a certain number of works of painting and sculpture. The former go to augment the art collection of the Petit Palais; the sculptures are for the most part for the decoration of the squares and other public places of Paris. So far, the purchases of pictures have always been confined to the works of French artists; this year, for the first time, the Council have purchased a work by an English painter, "Le Dernier Voyage," by Mr. Frank Spenlove Spenlove, exhibited at the Old Salon. This first exception, made in favour of an Englishman, may be regarded as a new manifestation of the "entente cordiale."

During its last session, the Council decided on rebuilding and enlarging the Pont des Saints-Pères, which, in consequence, will be for about three months closed to public traffic. This bridge, where the traffic is very great, was built in 1834 from the designs of the engineer Polonceau. It connects the Square Voltaire with the Quai du Louvre, and is composed of three arches in iron formed by tubes with an elliptical section. It is decorated at its two ends with statues by Pétitot, symbolising respectively "Abundance," "Industry," "The Seine," and "The City of Paris."

Thanks to M. Dujardin-Beaumetz, the Under-Secretary of State for Art, the garden in the Cour de Carrousel, behind the Gambetta monument, adorned with masses of lilacs, is to be consecrated to the memory of French sculptors and painters. Four symbolical groups are to be erected in it. One of these, M. Landowski's group of "Les Fils de Caïn" (the shepherd, the poet, and workman), is one of these. Painting, sculpture, and architecture are to be the subjects of the three other groups, which will include portrait-busts of celebrated artists, such as Poussin, Watteau, Rude, and others. The scheme will probably be completed by the monument to the French landscape-painters which, as already mentioned, it had been at first intended to erect on the Cours La Reine. But in accordance with the subsequent decision of the Council to allow no more erection of sculpture in the Champs Elysées, it is probable that this monument also will find place in the Cour de Carrousel.

An old project, formerly much discussed, has recently been revived, which if carried out will give Paris a splendid new road. This is, to prolong the line of the Avenue de la Grande Armée as far as the Croix de Noailles, in the Forest of St. Germains, thus making one great straight line of road of the Avenue des Champs Elysées, the Avenue de la Grande Armée, and the Avenue de Neuilly, as far as the Pont de Courbevoie. The cost of completing this great avenue, which will necessitate two bridges over the Seine, is estimated at ten million francs. It would form, between the Tuileries and the terrace of St. Germains, a promenade unique in the world.

The Ministry of Fine Arts has recently proposed to remove from the façade of the Opera House the celebrated group of "The Dance," by Carpeaux, in order to place it in a museum, under pretext of preserving from injury by violence or by the action of the weather. The proposal will probably meet with strong opposition, and Mdme. Carpeaux, the widow of the eminent sculptor, has protested vehemently against the removal of his work, which is not approved either by M. Dujardin-Beaumetz. He is of opinion that the best preservation of the group would be a simple cleaning, of which the whole façade of the Opera stands in much need, for the colour of the rose marble, and the gilding with which Garnier profusely garnished his work, have long ago been hidden under a thick coating of dust. The cleaning of the façade is at all events to be carried out, and the original polychromatic design of the architecture will thus be brought out again.

Last year Mr. James Stilmann, President of the National City Bank of New York, presented to the Ecole des Beaux-Arts a sum of 500,000 francs, the interest of which is to go to forming travelling studentships for French pupils at the Ecole. According to the decision of Council of the Ecole, this fund is to be distributed, for the first time, this year; and the sum available, which amounts to 15,000 francs, will be divided into twelve studentships of 1,200 francs each, to be distributed as follows:—Three studentships to painters, three to sculptors, four to architects, and two to engravers. The choice will fall on those students in each department who have obtained the highest "recompenses" during the scholastic year, with the exception of the Grand Prix de Rome, and the beneficiaries will be required to make their tours of study from August 1 to October 15.

A Committee has been formed to raise a monument in Paris to the memory of Garibaldi. It is entrusted to an Italian sculptor, Signor Cochi, and will be erected on a new *place* to be formed in the XVth Arrondissement, on the occasion of the centenary of Garibaldi.

The Louvre will receive soon an important collection which has been offered to it by M. Moreau Nélaton, and which includes thirty-five pictures by Corot, eleven by Delacroix, and others by Manet and Carrière.

We have to record the death, at the age of seventy-eight, of Jules Breton, widely known as a painter of peasant life and of the fields and the sea, and who, as far as his peasant figures were concerned, might be regarded as in some degree the precursor of Millet. Success came to him early, and, after quitting his first atelier at Drolling, he obtained in 1855 a third medal at the Salon for his "Les Glaneuses," while in 1857 the "Bénediction des Blés" earned him the second medal of the year. The latter picture is in the Luxembourg Museum. In the exhibition of 1859 he obtained a first medal and the cross of the Legion of Honour. He was then only thirty-two years of age. In 1865 he exhibited the "Fin de la Journée," and was promoted to be "officier" in the Legion of Honour. In 1872 he obtained the "Médaille d'Honneur" of the Salon for two very remarkable works—"La Fontaine" and "Jeune Fille Gardant les Vaches." He continued for many years to produce a series of fine pictures, and in 1886 was elected a member of the Académie des

Beaux-Arts; and some years afterwards he was made "Commandeur" in the Legion of Honour. Of late years he had ceased to exhibit, and to the younger generation his work was not much known; but it will certainly not be forgotten. M. Breton was the father of Mme. Demont-Breton, herself an artist of genius.

MAGAZINES AND REVIEWS.

THE *Art Journal* includes an article by Mr. H. C. Corlette with the title "Architecture and Painting," but which seems to be really a review of the decorative work of Mr. J. D. Crace, who well merits the compliment of being taken as a text for an essay on this subject, with which in the main we are quite in agreement. But we do not understand the remark in the closing sentence, that the Sistine ceiling paintings would be quite out of place if transferred to the vault of Westminster Abbey—at least we do not understand the reason given: "The curved ceiling of a church is an admirable field for decorative design in colour, whether floral, pattern, or figure work. But it is the wrong place for any kind of painting which is first of all pictorial and only secondarily decorative." But the ceiling of the Sistine chapel is a curved section. Did Mr. Corlette forget that? In a note on the work of the late Mr. Brabazon, who produced pictures which were blots of harmonious colour without any attempt at drawing, we are told that "it is one of the hundred sins of omission on the part of the Chantrey Trustees that they have disregarded his delightful art"; a sentence which serves to give us some idea of what the Chantrey purchases would have been like if they had been in the hands of some of the critics of the Academy.

In the *Burlington Magazine* we are glad to see an illustration of a picture by Northcote, with a note in favour of this much neglected and indeed nearly forgotten artist. One or two works by him in recent loan exhibitions have surprised those who only knew him previously from his recorded conversations with Hazlitt. Probably his historical pictures are of little interest now, but he was evidently a much better portrait painter than the present generation have hitherto had any idea of. Mr. C. J. Holmes, who writes the note, comments on the fact which more than one modern French critic has noticed, that there is so little of a fixed tradition in English painting, each artist going his own way, or taking hints from this or that painter among his predecessors, according as his fancy led him. Accordingly, the picture here in question, attributed to Northcote, is said to show evidence, in its execution, of imitation of the manner of Reynolds in one particular, of Romney in another. The number contains an article by Mr. Solon on a rather new subject, "Coloured Pottery of the Renaissance in the Austrian Country," a review of a German book on the subject by Ritter von Molthein. The illustrations include two remarkable examples of earthenware stoves of about the date of 1500, one of them from the Castle of Salzburg.

In the *Architectural Record* (New York) is an article by Mr. Montgomery Schuyler on "The New Custom House at New York," of which Mr. Cass Gilbert is the architect. The comparison of the illustration of the old Custom House with the new suggests some considerations on the architectural employment of the Classic Order in modern buildings. Mr. Schuyler maintains, and we agree with him, that the monolithic Ionic colonnade of the old Custom House, with the space behind it, was a much finer architectural effect than is presented by the new one with its engaged order; that it is true the other one shut out light from the rooms, but this was merely a question whether or not architectural effect should be sacrificed to convenience or not; that it was possible the architectural effect was the thing, of the two, the better worth having; at all events, that there should be no compromise; use the Order in its true architectural sense, as an order of free columns, or dispense with it altogether. There is a good deal in this. It is rather curious to find in the same issue Mr. Schopfer, in the second instalment of his essay on Roman art, arguing just the contrary, and asking us to recognise what an effective use the Romans made of engaged Orders in the Colosseum.

In *Concrete and Constructional Engineering* for July the promise of the two previous issues is well sustained by original articles and selections of matter from various sources relative to concrete and reinforced-concrete construction. An article on "The Historical Evolution of Reinforced Concrete in France," by M. de Tedesco, necessarily covers well-trodden ground, and refers at length to the work of such pioneers as Coignet and Hennebique. As an example of the activity displayed by M. Hennebique, it is said that "from 1892 to 1899 3,000 constructions of various kinds in reinforced concrete to a total value of two millions sterling had been carried out by his firm alone." This remarkable record is largely the result of an unrivalled commercial organisation, but it is probably due in no small measure to the extreme simplicity of the Hennebique system, and the invariable satisfaction that has attended its adoption. The most interesting part of the article is that foreshadowing the general scope of the French regulations governing reinforced-concrete construction. "Reinforced Concrete Bridges," by Mr. W. Noble Twelvetrees, M.I.Mech.E., is the first of a series of articles, the present instalment dealing with various types of girder construction, from the simple foot-bridge to works intended for heavy road and railway traffic. Some typical examples are also given of reinforced concrete arches in Europe and America. A second article is printed on "The Setting of Portland Cement," this time from the pen of M. Candlot, of Paris, who treats the subject from the French standpoint. After showing reasons for the capricious behaviour often exhibited by cement in the process of setting, the writer shows how this may be rendered more regular. The methods in question are interesting theoretically, but certainly should not be permitted in practical work unless under most careful and experienced supervision. Moreover, by selecting cement of suitable character in the first instance expedients of the kind are quite unnecessary. On p. 183 two paragraphs referring to cement that "appears to set extremely slowly" are somewhat ambiguous, not to say contradictory, apparently because the translator has not completely caught the precise meaning of the writer. This is a pity, because the subject matter is of real importance. Among the remaining articles that by Captain Sewell, U.S.A., on "The Theory of Reinforced Concrete" deserves special mention as a useful summary of the present position of reinforced concrete in the United States by an engineer who, as an officer of the Corps of Engineers, has had considerable experience of that material in the execution of various important works.

The *National Review* contains a very interesting article by Lady Susan Townley on "The Panama Canal," from the point of view of a visitor occupied with the aspect and impressions of the country through which the canal is to be carried, the present stage of the work, the condition of the workmen connected with it, and stories in regard to the state of things in the early days of the enterprise under the French. Lady Susan seems to have found evidence and full admission on the part of the American staff, that the work already done on the canal by the French in the days of De Lesseps was by no means unimportant, and that they had at least gone very far in rendering the task easier for their successors.

The *Nineteenth Century* contains two articles on artistic subjects, one of them as good as the other is bad. The good one is "International Art: A Duologue," carried on between two ladies, Elizabeth, an ultra-modern æsthete, and Jane, a Philistine (as her friend considers her), in respect of that horrible exhibition called the "International" held not long since at the New Gallery. Jane, after patiently going through it with her friend and listening to her instructions, points out that everything they have seen is ugly; that she liked a pretty *danseuse*, but that even the studies of ballet-girls seemed only designed to show how ugly they could be; from the pretty *danseuse* the artist shrank; he was true to his ideal, "the ideal of ugliness, squalor, and degradation glared at us from every wall." We go to art, she says afterwards, for a world seen through other eyes, not for life as it is to us, and the question is whether we should see it through the eyes of painters like Mason, Corot, and Puvis de Chavannes, or through what rather appear to be eyes of waiters, sceneshifters, and attendants at lunatic asylums. Elizabeth is speechless with scorn, and Jane concludes the interview by saying, "I am going to the National Gallery." It is a clever and bright bit of satire; Miss F. P. Seeley is the author. The bad article is one by Mr. H. Hamilton Fyfe on "The Revival of Sculpture," which commences with the usual cant about the contemptible character of the paintings at the Royal Academy, describing the present exhibition as "the worst of the worst" (there are better pictures in it than Mr. Fyfe can understand), and going on to state that this year there is—for the first time it is implied—a revival of sculpture in England, that the sculpture at the Academy alone saves the exhibiton from contempt, and this (of course) is due to the influence of Rodin. It is true that the sculpture this year, as in some previous years recently, is the best part of the exhibition; but if the writer knew anything about his subject he would have known that the remarkable advance in English sculpture commenced at least fifteen years ago; that Rodin had no more to do with it than the man in the moon; and that as a matter of fact two or three of the previous sculpture years have been distinctly superior to the present one. The number concludes with a short and admirably expressed article on "Improved Shop Architecture for London," by Sir Aston Webb, written especially in respect of the new Regent's-quadrant, and pointing out, in regard to the foolish clamour of the shopkeepers for their plate-glass fronts, that the most superficial observation shows that it is not necessarily the best firms that have the largest window shows, but rather the contrary; he works out at greater length, in fact, the argument that we have before suggested in a Note on the subject, that good and solid architecture in shop fronts is a quality which an improved public taste is likely to demand more and more, for the sake of the dignity of our street architecture, and that it will in the end be to the interest of the best class of shops to encourage instead of opposing it.

THE CLERGY AND ARTISTS' ASSOCIATION EXHIBITION AT BRIGHTON.

THREE rooms at the Brighton Public Art Galleries are devoted to a miscellaneous exhibition—the tenth of its kind—got up by this Association. In the catalogue it is set forth that "the aim of the Association is to meet the growing demand for freshness and imagination, for personal expression by the artist, freed from mere conventionality and assumed tradition . . . to counteract the evils resulting from the low standard of art in churches at the present day, and to form a centre to which the clergy and others could apply directly for advice and help . . ." It is difficult to say whether this possibly laudable aim has been overreached in the present exhibition, or merely not yet attained; but we are much exercised as to what can be the net effect on the minds of the good people of Brighton, visitors thereto, and others whom it is expected to concern, who try to take this exhibition as a serious contribution to present-day ecclesiastical art. Amongst the innumerable exhibits by the hon. secretary of the Association, Mr. Reginald Hallward, there may be some rather nice suggestions for the simple painting of church roofs, &c.; but his "Vision of Death," though never so full of symbolism, his "Vision of Spring," with a most distressful maiden fleeing as for her life from some half-dozen woolly white birds at her head, and his "Dwarfs Disturbed by a Witch," constrain us to ruminate whether such works are seriously meant to have homes found for them in the clerical drawing-room or study, or perchance to adorn some hapless village church. There are some vigorous and well-drawn cartoons by Mr. Louis Davis for windows in the chapel at Wynyard Park which are commendably free from that affectation and effeminacy in form and colour characteristic of so much that may be seen in this exhibition. Mr. Conrad Dressler has a panel in enamelled earthenware entitled "The Crucifixion," and we sincerely hope, in the name of "authentic artistic quality" (*vide* preface to catalogue), that the piece shown is but a part of the panel, and that the poor dismembered robbers come into

their own in the completed composition. Quality is also sadly lacking in the blues and greens of the enamels. There is a good altar cross in polished steel by Mr. Bainbridge Reynolds, and a series of fine photographs of a ship vane for Osborne Cadet College. The construction of his brass lectern is, however, anything but sound, nor would the leather aprons be tolerated. Turning to the architectural exhibits which are scattered through the three rooms without much classification, there is an excellent detail drawing for reredos, Hornsey Parish Church, by Mr. H. C. Corlette, where the altar and retable, as well as the treatment of the wall surfaces on either side of the reredos proper, have all received careful attention. The colour scheme as indicated in this drawing is very happy. Mr. Corlette's drawing of the colour decoration in the Lady Chapel, Chichester, by Theodore Bernardi, A.D. 1519, is also one of the good things of the exhibition. The same may be said of the design for a small village church, by Mr. F. W. Troup, where the altar is set in a splayed recess with vaulted roof with wonderful accession of dignity to so small a church. Good photographs of Mr. Troup's brick diapered "Sandhouse, Witley," are shown, as well as a quiet country house admirably terraced to its hilly site. Sir Charles Nicholson's interiors of St. Alban's, Southend—notably the chancel screen—and Cockington Church show the virtue of method and restraint. Mr. A. H. Skipworth has numerous exhibits of a type of work which has, perhaps, suffered from over-illustration. We like the exterior of Mr. Ernest Newton's church at Hither Green chiefly for the honesty of his treatment of the chimney stack as seen from the S.E. Then, besides landscapes, book illustration and binding, chairs, &c., there are hatpins, brooches, necklets, and the rest.

The exhibition is to remain open until August 15.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS:

ANNUAL MEETING IN LONDON (*continued*).

THE following is the conclusion of our report of the proceedings at the annual meeting of the Association on Thursday, Friday, and Saturday, June 28, 29, and 30.

Mr. S. H. Chambers (Hampton) thought there was danger of the pollution of the estuary of the Thames by the deposit of the mud of the London sewage therein.

Mr. Wilkinson (Manchester) thought Mr. Dibden's statements as to sludge-pressing and chemical precipitation subject to a considerable amount of qualification. There were cases in which chemical precipitation and sludge-pressing were an absolute necessity. He submitted that where sewage was fouled to an inordinate extent by chemical refuse that chemical treatment was almost a *sine quâ non*.

Mr. Dibden said there had been some misapprehension as to the sense in which he used the words ancient history. He did not mean them to imply that in every case chemical treatment and sludge-pressing were useless, but that it was useless for him to say anything about them.

Mr. F. W. Pearce (Twickenham) said they had now reached the stage at which they could all agree that the tank treatment of sewage was the best preliminary method.

Mr. G. W. Lacey (Oswestry) remarked that there seemed at present no possible hope of obtaining finality in regard to the treatment of sewage.

Mr. Watson, in reply, said no one was more surprised than himself when he found it possible to reduce sludge to a non-stinking state.

Mr. Dibden, in reply, agreed with Col. Jones that the sooner the sewage matter was disposed of in the earth the better. That was the object of the bacteria bed. He laid it down in the first instance that the bacteria bed was nothing else but artificial land. There was no danger whatever of the sludge settling down in the estuary of the Thames. He had spent weeks dredging the channel and taking samples, but had never found a trace of the sludge. His successor, Dr. Clowes, had also done the same, and never found a trace of it.

The proceedings of the Annual Meeting were resumed at the Institution of Mechanical Engineers, Westminster, on Friday, June 29, Mr. J. Patten Barber, President, again in the chair.

Carrying-out of Public Works.

Mr. A. H. Campbell, M.Inst.C.E. (East Ham), read a paper, entitled "Notes on the Carrying-out of Public Works Departmentally." He said this question was one much to the fore at the present, and that the annual meeting was a proper place for some official pronouncement on this matter of public policy could not be questioned. The vast annual expenditure on local works—for the design and construction of which the members of that Association were in the main responsible—and the various views held by different authorities as to the best method of carrying-out such works, entitled the Association, from its most intimate knowledge of the subject, to be a fit vehicle of official opinion as to this question of public policy.

Recent decisions, moreover, of the Local Government Board in their sanctions to loans, seemed to call for consideration. Without referring to individual cases, which in that paper would be obviously indelicate, the author submitted in general terms those objections which the central authority had recently raised when sanctioning, or, withholding sanction, to loans. These are as follows, viz.:—(1) That excess of expenditure incurred beyond that for which a contractor might reasonably have completed the work, is a proper surcharge upon the authority carrying it out; (2) that no payment out of borrowed moneys should be made to any salaried officer of the Council, save, under certain conditions, the clerk; (3) that the wages of any permanent staff or workmen of the authority should not be charged against the loan, although such workmen and staff may be solely engaged upon the work for which the loan is sanctioned.

Strictly interpreted and applied to local life, those conditions of sanction seemed to preclude the carrying-out of works by direct labour, or, at least, to put across its path such barriers as made its progress difficult. Looking at those objections in their order, the first-mentioned—that of surcharge—imposed upon the local authority a risk which they were hardly likely to accept, either in their individual or their corporate capacity. Surcharges were the pin-pricks of public life, and it was well to avoid them. Whether intended or not, this decision operated as an almost effectual deterrent to the policy of direct labour, especially where the elements of risk applied. The conditions, therefore, that made for success, and *vice versâ*, should be examined, and these the author stated as:—(1) That for any work about to be undertaken by direct labour under "sanction," the estimate of cost should be tested by the estimate of another expert; (2) that in the actual carrying out of the work the same system should apply, as between the engineer and his resident agent, as would apply were the work the subject of a contract; that was to say, the rules which regulated the carrying out of public works' contracts should apply to the policy of direct labour, monthly measurements being made by the engineer of the value of works executed, and that he certify to the authority as it in the case of a contractor; (3) that in the execution of the works the engineer or manager be granted a free hand as regards (*a*) purchase of materials at the lowest market prices, (*b*) as regards employment and discharge of labour, and (*c*) as regards the administration of all details. The system of monthly measurements of work done would prove an effective check during the progress of work as to whether the authority, as direct employer of labour, was holding its own in the matter of cost. It was further essential at the outset of any work to be done by direct labour, that an analysis be made of the estimated value of materials, and of labour for each separate section of the work. Such analysis would reveal upon what section of works profit or loss was being made, and at the end of a work the resultant gain, or the reverse, over the completed work. A further factor determining the success of this policy, was the hearty and substantial backing of the public authority. The author would not say "unanimous" backing, for, in the composition of a Council, unanimity was not desirable; but, certainly, the policy of direct labour demanded for its success the confidence and enthusiasm of such a substantial majority as would, in numbers and intelligence, fairly represent the sentiments of the authority, and that still stronger sentiment of public opinion behind the authority. For illustration one had only to recollect the chequered career of the Works Department of the London County Council in its early days. Until the party supporting this policy obtained at the polls such pronounced ascendency, the Works Department scarce realised security of existence. Since the composition of parties had changed, and apparently so for a long lease of power, the Works Department had prospered—that was to say, along lines that, if not liberal, were certainly fair to the Department, and which, if copied by other authorities, might produce like results. These are:—(1) The Works Department does not tender in public competition with contractors, but its tender is based upon that of the Chief Engineer or Superintending Architect of the Council; (2) the Department is allowed fairly free scope in its arrangements with labour, by payments for work done on the "bonus" system. This acts as an undoubted spur to the men in the diligence of their daily work and their individual output; (3) the Department, in the carrying on of its work along those lines, is the expression of the people's will. So long as it enjoys that support, it should continue to prosper. Change the composition of the Council, then may come the imposing upon the Department of tests that irritate, and of conditions that may kill. The Works Department of the London County Council had been selected, because it was the first authority in the country, for the magnitude and probably continuity of its constructive necessities. They were undoubtedly the leading exponents of the policy of direct labour, generously applied, and with results which, in the quality of its workmanship could not be surpassed. Objections 2 and 3 of the Local Government Board, viz.:—"Any payments out of capital accounts to any salaried officer . . . or as wages to any permanent workman" of the authority, seemed to preclude altogether the possibility of separate existence of a Works Department, unless such salaries and wages were to be paid out of revenue account. The last-named application to the wages of permanent workmen was a new decision of the Board, and one of possibly far-reaching importance considered in its relation to this subject. If it did not expressly veto the direct employment of labour on municipal and public works, it would tend to cripple the policy and hinder its progress. As a way of meeting and combating, possibly, dishonest trading combination, undoubtedly direct labour was a sure defence. From that origin had sprung the County Council's Works Department as it was to-day; and as the living embodiment of the well-settled policy of the County Council it had achieved a great measure of success, favoured by the conditions which regulated and fostered its existence.

Mr. W. Harpur (Cardiff) proposed a vote of thanks to Mr. Campbell for his paper, remarking that he had treated the subject in a very fair manner indeed.

Mr. T. W. A. Hayward (Battersea) believed that if works were carried out properly by direct labour that money could be saved. No one could buy material so cheaply as a municipal authority, and they could also assure satisfactory workmanship.

Mr. C. F. Wike (Sheffield) said the average expenditure in Sheffield on works carried out by the Works Department was 300,000*l*., and, in his opinion, not only had the Council secured satisfactory work, but had got it at a minimum cost.

Mr. Nisbet Blair (St. Pancras) said they did not always secure from workmen in the employ of a Corporation the same amount of work as under the stronger domination of a contractor and his foremen. There was a tendency to go easy, and it was often encouraged by some of those who ought to give them strong and zealous support when they were undertaking work on their behalf. In some instances workmen's representatives on the Councils urged the men to go easy. There was another danger. The establishment of these large Works Departments was, under present circumstances, the preparation of a huge voting machine.

Mr. Campbell, in reply, said there was a whole-hogger contract party as there was a

direct labour party, and, being diametrically opposed, it was as difficult to convince the one as the other.

Motor Vehicles for Municipal Work.

Mr. A. Brodie, M.Inst.C.E., M.I.Mech.E. (Liverpool), read a paper on "Motor Vehicles for Municipal Work." He said the use of light motor vehicles for industrial and other purposes first became practically possible in this country after the passing of the Motor Car Act of 1896, and about that time several societies and associations were formed for the purpose of gathering together persons interested in the advancement and improvement of motor traction on ordinary roads.

In 1896 a branch of the Self-Propelled Traffic Association was formed in Liverpool, having on its Council a number of influential representatives of the shipping interests and trade of the port of Liverpool and of the engineering profession, who expended a large sum and gave much valuable time for the purpose of encouraging the construction of motor vehicles for commercial purposes; and exhaustive trials, held in 1898 and following years in Liverpool, together with the very full reports and particulars of the performances of the vehicles, probably did more than anything else in the early days of the movement to make known the possibility of the heavy motor vehicle.

It was soon seen that a considerable opening for such vehicles would be found in the work carried out by municipal authorities, and during the trials, in May, 1898, the then Lord Mayor of Liverpool (the late Alderman Houlding) publicly stated that he was so much impressed with the working of the motor wagons that he would do what he could to see whether the motor-car would not be a great improvement in the Corporation service, as compared with horse-and-cart traction.

At the conclusion of the first motor trials an order was placed with the winners of the gold medal for a 4-ton steam vehicle for the use of the Liverpool Corporation; and this machine, delivered in January, 1899, was still at work, though it was soon found advisable to reduce the load carried and to use the vehicle for a lighter class of work than was originally intended. It had, however, been found a most valuable help in quickly conveying materials from depôts to street works in progress and street-gravelling, and during the summer season it had been largely used for street-watering and other purposes in which the weight of the load to be carried was not a matter of first importance.

The experience gained by the regular working of the earlier types of vehicle was of considerable value to users and manufacturers, and it was soon found that oil-firing would have to give place to coal or coke-fired boilers, whilst, contrary to the general practice in the lighter type of vehicle, the vertical type of engine originally adopted had also given place to the horizontal type, no doubt principally due to the demand for platform space.

After the completion of the third Liverpool trials in 1900, the City of Liverpool ordered from the Lancashire Steam Motor Company, Leyland—who again secured a gold medal—six 4-ton steam motor wagons, which were obtained in the beginning of 1901, and these wagons had been continually in use up to the present time.

The Liverpool Corporation wagons had been well maintained, and were now in good working order, all unsuitable portions having been replaced; and the repairs at the present time were costing less than formerly, whilst the average time lost was also less than at any period of their life.

The principal troubles which had been experienced in connexion with the use of these motor vehicles had arisen from the fact that they were originally constructed to comply with the then existing law that the tare weight should not exceed 3 tons, which it was advisable to make one of the conditions of the specification.

It was, however, soon found impracticable to adhere to the tare limit if the vehicles were to carry paying loads, and very considerable alterations had had to be made to them, and the weights of such parts as frames, springs, axles, and wheels had been materially added to, the total weight with steam up and ready for work now amounting to 4 ton 19 cwt. on the average, as against their original nominal tare of 2 ton 19 cwt. 3 qr.

The passing of the Motor Car Act of 1903, combined with the regulations which were subsequently issued, was welcomed by motor-wagon users throughout the country generally, as it legalised the additions which had already been made as a matter of necessity. The alteration in the weight limit, together with the additional requirements as to the width of tyre, appeared to have met the demands of motor-users; and since the necessary alterations to comply with the provisions of the Act had been completed the difficulty at first experienced in maintaining the motor-wagon wheels had entirely disappeared, and the only difficulty which still remained was the noise and vibration caused by the running of the wheels over the comparatively rough roadways, and this difficulty was likely to remain so long as a rigid wheel was driven at a considerable speed over the rigid and uneven roadways which still exist to a considerable extent in the older neighbourhoods of Liverpool.

In Liverpool a considerable number of wheels had been experimented with. In the first instance the manufacturers of a solid rubber tyre came forward and offered a contract with the payment arranged on the basis of mileage run, the existing wheels being provided by the company with special rims suitable for their own type of solid rubber tyres. The front wheels of the wagon, which at the time carried an axle-load of 2½ tons, ran some 1,500 miles before failing, and satisfactorily reduced noise and vibration so long as they lasted. The driving-wheels, which carried an axle-load of 6½ tons, only lasted 300 miles; and up to the present time, though every effort had been made to obtain a guarantee of solid rubber tyres, no manufacturer had been found ready to contract with the Corporation for rubber tyres for these vehicles, although for some purposes the Corporation were prepared to pay a rate per mile in excess of that now annually paid for the maintenance of motor omnibus tyres.

A trial was also given to an early type of resilient wheel manufactured under the Gare patents, the tyre consisting of hard-wood blocks jointed on rubber with treads consisting partly of fibrous material, the whole being completely impregnated with rubber solution. So far these wheels had not completed their mileage under the contract. This type of wheel had undoubtedly advantages, especially in the matter of freedom from side-slip on stone set pavement, and also to a great extent from noise, but there appeared to be some difficulty in making it sufficiently lasting in the case of the driving wheels where the axle-load amounted to 8 tons.

A metallic wheel under the Hele-Shaw patents had also been experimented with, and this type of wheel had completed a distance of about 3,000 miles. The noise and vibration had been considerably reduced, but up to the present time the spokes had been rather light for the strains thrown upon them in Liverpool due to the axle weight and the rough condition of the boulder-paved streets passed over.

An offer was also accepted for the trial of a pair of wheels with a rubber tyre shielded by metallic sectional plates called the "Buckingham" tyre, but this wheel did not give satisfactory results, as a number of the shields gave way, and these had the effect of injuring the resilient tyre underneath.

Another pair of wheels had been tried to some extent, the tread portion consisting of paper impregnated with a composition and afterwards compressed between plates, and this arrangement had undoubtedly resulted in a quiet wheel, but the trial had not been sufficiently extended to state definitely whether a satisfactory life could be got out of it.

Some two years ago the idea occurred to the author that it might be worth while to try the wear of double pneumatic tyres with an outside stiffened rim, so that the vibration due to the hammering of the tyre on the setts need not be transferred to the machinery, and a pair of wheels on this principle were constructed, and had been continuously in use since January, 1905, travelling over 5,000 miles, and had required practically no attention beyond the fixing of stops between the outer and inner rim, and the rubber tyres could be avoided.

A peculiarity which had been observed was that the wear on the steel tyre was noticeably less than in the case of the tyres shrunk on to the wooden wheels direct, and the cost of maintaining the machinery was also less, due apparently to the reduction of vibration.

Mr. H. T. Wakelam (County Surveyor of Middlesex) proposed a vote of thanks to Mr. Brodie for his paper.

Mr. A. E. Collins (Norwich) said the cost of repair of the earlier motor-wagons was so heavy that they thought of dropping them altogether, but a wagon bought three months ago under the new regulation as to weight had not cost a penny in repair. Where they could load and discharge quickly motors did the work much cheaper than horses.

Mr. Harpur (Cardiff) said he had four motor-wagons working on the collection of refuse, and his experience was not favourable, as they cost 35 per cent. in excess of the cost of the same work when done by horse haulage.

Mr. O. E. Winter (Hampstead) said his experience of motor-wagons for refuse collection was the same as Mr. Harpur's, that they cost 30 to 40 per cent. more, but for street watering they had given excellent results, coming out much cheaper than horse haulage.

Mr. E. G. Mawbey (Leicester) having spoken,

Mr. Brodie briefly replied to the discussion.

Road Construction, etc.

Mr. H. T. Wakelam, M.Inst.C.E. (County Engineer of Middlesex), read a paper on "Road Construction, Maintenance, Improvements, and Subsidies." He said that the suitability of the principles of road formation and construction, followed for so many years in this country, had of late been much questioned as to whether the principles were framed on the right lines or otherwise to meet the requirements of the mechanical traction introduced upon main and district roads in recent years. In consequence of this mechanical traffic and its resultant dust nuisance (for five or six months of the year) considerable agitation had been and was being created in various directions for an improvement of the highways of this country, and many ideas were being put forward with a view to effecting a drastic change and reform in the existing arrangements and systems connected with road maintenance throughout England and Wales. Rainfall was the greatest factor of all in connexion with roads and their maintenance, and in differentiating the degrees of its influences, construction, drainage, quality, and selection of materials, etc., formed an important part. Given a good subsoil, a good foundation, good materials, consolidation, etc., a macadamised highway, formed upon proper constructive principles, should not be much affected when subjected to the mean rainfall of this country, provided a proper system of drainage had been devised to meet the ordinary requirements of each particular case. The author understood that a State Institution had been suggested or formed to initiate tests of different stones suitable for road macadam, in addition to which, as all the members were aware, tests of various materials assumed to be suitable for such a purpose had in different directions recently been made. That disintegration takes place under light motor-cars with smooth india-rubber wheel tyres could not be gainsaid, and these tyres caused more wear and tear to road surfaces than was perhaps appreciated. The passage of rapidly-moving motor-cars along carriageways, especially in which flints or poor quality materials were used, caused the particles of the detritus in the interstices of the metalling to rise to the surface, to be subjected to crushing by heavier vehicles with ordinary wheel tyres, and so to create a large addition to the dust nuisance. With a general use of basalts or granites, well steam rolled, first in a dry state until a mosaic-like surface was obtained, and afterwards covered with ½-in. chippings of the same material as that used for metalling, blinded with machine dust also of the same material, and well watered and rolled until thoroughly consolidated, the dust nuisance would be considerably reduced. This method of sheeting resisted much abrasion, with a minimum of wear by light

locomotives and mechanical traffic, and obviated much disintegration. In his opinion the most complete mitigation of the dust nuisance would be best obtained by the utilisation of some suitable agent in connexion with basaltic or granite road formations, or some such hard-wearing materials, so as to procure an asphaltic kind of road surface preparation with a good foothold for horses. The first cost in most counties of basaltic or granite formations, untreated with asphaltic or bituminous compounds, left sufficient margin in cost to allow some kind of treatment to ensure an efficient degree of waterproofing, at any rate favourably comparable with treated slag or limestone, and with a resultant life much longer than could possibly be obtained by the use of either the latter materials under heavy-traffic conditions. Some such formation had lately been carried out on the Heaton Moor road near Stockport, Cheshire, and in the Stretford Urban District, Manchester, at what he understood to be a most reasonable first cost. In connexion with these roads the Local Government Board granted a loan for fifteen years, over which period the repayments of principal and interest extend. From calculations for repayments of instalments of principal and interest with charges for maintenance scavenging and watering, etc., on main roads carrying the heaviest traffic in Middlesex, the author found that when a road costs (inclusive) about 2s. 6d. per sq. yard per annum to maintain in macadam, scavenge, water, etc., it was in the end as cheap to pave it with soft wood on a Portland cement concrete foundation as to continue the use of macadam. The Local Government Board granted loans for creosoted deal-paving to be repaid in five years, with twenty years for the concrete foundations. An equated period of nine years for the blocks and concrete together could also be obtained. Five years could not be considered to be the full life of soft-wood paving, as there were roads in Middlesex paved with this material carrying a heavy traffic which had not been repaved for nine years, and upon which the original deal blocks were still in a good condition. This factor must be taken favourably into account in considering the replacement of macadam by wood paving.

Mr. W. Harpur (Cardiff) moved a vote of thanks to Mr. Wakelam. He said the question was one which more directly concerned county surveyors, as the nuisance was more observable on county roads in consequence of the absence of facilities for watering and cleansing

Mr. Dryland (County Surveyor of Hereford) thought the manner in which the money was raised for road maintenance would have to be changed. The use of the roads could not now be said to be local, as it was in former times, and he thought the cost of maintenance would have to be moved from local shoulders to the whole community. Tar-painting of macadam roads preserved the surface to a considerable extent, increased the life of the material, and reduced the nuisance from dust.

Mr. Leete (County Surveyor of Bedford) approved the policy of tar-painting the roads, which he had done in Bedfordshire with much success.

Mr. R. Brown (Southall) advocated the use of oil-tar on the roads for dust-laying purposes.

Mr. Purser (Grantham County Surveyor) criticised any system of putting oil on the roads, and expressed a preference for tar-painting.

Mr. Wakelam was thanked for the paper, and briefly replied to the discussion.

On Saturday a visit was paid to the Northfleet Works of the Associated Portland Cement Manufacturers, Ltd., and, after an inspection of the works, the members were entertained to luncheon. Mr. White, Chairman of Directors, presided.

REMBRANDT CELEBRATION.—The three-hundredth anniversary of Rembrandt's birthday will be celebrated at Amsterdam on July 15-16 with the exhibition of some paintings from the Royal Galleries and of examples of modern pictures by Sir Lawrence Alma-Tadema, R.A., Israels, Maris, Rochussen, Weissenbruch, and Mauve. In our number of last November 4 we gave some particulars of the house, No. 4, in Joden-Breestraat, Amsterdam, inhabited by Rembrandt, and of its purchase by the municipality for a museum.

FIRE-RESISTANCE OF BUILDINGS CONSTRUCTED WITH REINFORCED CONCRETE.*

Importance of being able to Attack Fire at Close Quarters.

ALL practical fire-fighters will, in view of their own experiences, unanimously agree that the fullest success in fire-fighting can only be secured by vigorous attacks at close quarters inside the burning building. Unless in some measure such close attacks on the discovery of a fire can be made with ample volume of water at efficient pressure, the building involved, especially if of large extent, will probably with its contents be destroyed, and the prevention of the spread of fire to the surrounding property may become both difficult and dangerous. Buildings erected to meet these requirements have lamentably failed under the test of actual fires, chiefly owing to non-compliance with conditions obviously necessary to secure success.

Nature of Buildings Needed to Assist Firemen.

To avoid such disasters, buildings effectually separated into compartments of moderate extent, planned without unprotected floor openings, and constructed so as to give ready and secure access for firemen to every part, for the longest period of time possible after an outbreak of fire, are required both in the interest of the public and of the chief officers of fire brigades and salvage corps and the men under their command. Buildings constructed with reinforced concrete, properly prepared with suitable aggregates, sand and cement, ample thickness of such concrete being continued in front of all metal rods or net work, will satisfactorily meet these requirements if the conditions as to extent and other provisions referred to are duly observed.

Danger of So-called "Fireproof" Buildings having Structural Metal Work Unprotected.

Experience has repeatedly proved that large buildings constructed with incombustible materials only, but without due due protection against the inevitable action of heat, fire, and water on the metal and other materials used, although called "fireproof," are during the burning of their contents of a most treacherous and dangerous character, defying all reliable calculations as to the time and manner of their certain collapse. Responsible officers therefore very properly hesitate to send men into or even close to such buildings after any portion may be well alight, and frequently structures of this nature are unavoidably left to their fate.

Responsibility of Architects and Engineers.

Why architects and engineers continue to waste their clients' money on the erection of dangerous buildings of this character and proclaim them "fireproof" is a mystery which firemen fail to comprehend. It cannot be too strongly asserted that it is false economy of the worst description to omit efficient protection against the action of fire for all structural metal work used in important warehouse and factory buildings.

Slow-burning Buildings.

In view of the experience referred to in the case of buildings constructed with unprotected metal columns and girders, the use of timber in post and beams of large scantling with thick plank floors, made air and water tight, have been extensively employed with considerable advantage, especially where protected with an efficient system of automatic sprinklers, further advantage would be secured if the timber used is made thoroughly and permanently flameproof, but effective processes with this object appear at present to be too costly for general use.

Reinforced Concrete.

The term "reinforced concrete" is used to describe systems of construction in which iron or steel, in the form of rods, bars, or network, is embedded in concrete, both horizontally and vertically, so as to take all tensional strain and offer resistance to shear, leaving the concrete to resist compression, thus uniting both materials so that each is applied to the best advantage.

Previous methods of fire-resisting and slow-burning construction, especially for warehouses, trade, and manufacturing premises, are now rapidly giving place to reinforced concrete systems, used either alone or in combination with hollow reinforced concrete or porous terra-cotta blocks. These systems, it is hoped, will enable architects and engineers to meet conditions necessary to obtain resistance to fire.

Reinforced concrete is claimed by its advocates to be a new structural material, but this can only be conceded so long as normal conditions continue, which many users of these new structural methods appear to consider will always be the case, and therefore make no provision against possible if not probable changes resulting from fire amongst the goods stored in buildings of this construction.

The materials employed in reinforced concrete acquire no new fire-resisting qualities, and although they may be made effectively to assist each other in this respect and offer every facility for providing building of the character needed in the interest of the public and of firemen before mentioned, it is necessary, to secure such qualities, duly to consider and provide against the effect of heat, fire, and water on the materials employed, using only materials and methods proved from actual experience under various known conditions to be effective. This is equally necessary with reinforced concrete systems as with other methods of construction if satisfactory resistance to fire is expected and the avoidance of disasters that have occurred with other systems desired.

Building Codes and Fire-insurance Regulations on Reinforced Concrete.

The city of New York Building Code, 1901, provides that all systems of floor construction used in buildings required to be "fireproof" shall be submitted to an official test for four hours under a distributed load of 150 lb. per sq. ft. placed on bays 4 ft. wide between steel beams 10 in. deep, weighing 25 lb. per ft. run, having a clear span of 14 ft., these beams being protected in the manner adopted by the system under test, the temperature to average not less than 1,700 deg. Fahr. for the whole period of the test. At the end of this four hours' heat test a stream of water through 1¼ in. nozzle under 60 lb. pressure to be applied to the underside of the floor for five minutes; the top of floor to be then flooded with water under low pressure, and the stream from the 1¼ in. nozzle under 60 lb. pressure again applied to the underside of the floor for a further five minutes.

A load of 600 lb. per sq. ft. to be then placed between the beams equally distributed.

If during these tests any flame has passed or any part of the load has fallen through, or if the maximum deflection of the beams, having a clear span of 14 ft., exceeds 2½ in., the use of the system is prohibited in any building required to be "fireproof." Similar test regulations are also applied to partitions.

The materials used, the method of application and workmanship employed in the structure under test, constitute the standard for the system when used in actual building.

The American National Board of Fire Underwriters, in their carefully considered Building Code, recommend that the thickness of protecting concrete for all important metal members in columns and beams of reinforced concrete should be not less than 4 in.

The Fire Offices Committee of the United Kingdom require that for "standard fire-resisting buildings" constructed with reinforced concrete the aggregates and Portland cement used shall be of the special character defined, with a thickness of not less than 2 in. in front of all important metal members of columns and beams.

These requirements are the minimum that can be adopted with reasonable prospect of avoiding collapse in case of a serious fire amongst combustible goods stored in large buildings.

The Necessity of Precautions regarding Reinforced Concrete.

Hitherto architects and engineers who devote themselves to reinforced construction appear to be so confident of the strength and stability of this new structural material under all conditions that they fail to give reasonable attention to the fire-resisting qualities of the materials they use, being quite content to declare that steel rods embedded in concrete must be more fire-

* A paper read by Mr. James Sheppard, A.I.E.E. (Chairman, International Fire Library, Member of Executive of British Fire Prevention Committee), at the Milan International Fire Congress, 1906.

resisting than any other combination of materials.

Published examples of the action of reinforced concrete under actual fire fail to give definite particulars with regard to the diameter of the reinforcing rods, the composition of the concrete used, and its thickness in front of metal members. Information as to the nature of the fire and its extent, where extinguishing appliances are brought to bear, with the power of these appliances and water supply available, are also usually of the vaguest description or altogether absent.

Any photographs submitted by interested parties illustrating the effect of the fire will doubtless be taken from points of view most favourable to the object the photographer desires to serve. Sometimes such photographs do not even illustrate the portions of the building affected by fire, but only parts damaged from some other cause, such as explosion or shock, having no bearing whatever on questions of fire-resistance.

Experts in reinforced concrete buildings agree that to obtain the best results (considered only from a structural point of view and under normal conditions) reinforcing rods must be placed near the outer surface of the concrete, a thickness of 1 in. in front of the rods being generally adopted; but this thickness is altogether insufficient for the protection of metal rods against a serious fire, and the aggregates, sand and cement, for the concrete used to protect the metal rods are of the greatest importance.

It has been conclusively proved that concrete having gravel aggregates is especially unreliable under the action of fire, and the same may be said of other dense material. Aggregates that have passed through fire and are of a porous nature, such as broken stock brick, clinkers, clean coke-breeze with fine ground high-class Portland cement and sand, offer the greatest resistance to fire; but even with these materials a thickness of at least 2 in. in front of all important metal members is essential for reasonable security.

There would be no difficulty in applying a thickness of 2 in. of concrete of this description for the protection of all metal work, while the central portion of the concrete might be of different material.

It is to be feared that some of the large buildings already erected with reinforced concrete will fail when subjected to a serious fire amongst their inflammable contents, especially in cases where the building chiefly consists of extensive galleries round large central vertical spaces passing through all floors; such buildings certainly involve the possibility of very serious consequences, as proved in numerous instances, and even reinforced concrete construction can do but little to lessen this evil. The Horne Building, Pittsburg, is a case in point.

The method adopted for protecting columns and other parts of reinforced concrete structures against mechanical injury during the making and deposit of merchandise is of the greatest importance. With this object, in many large public warehouses constructed in reinforced concrete, steel angles of considerable size and weight are partly embedded in the concrete flush with its outer face at each corner of numerous square columns supporting very heavy loads; these steel angles are held in place by riveted eyes passing into the concrete. In the event of a serious fire amongst merchandise stored round these columns these steel angles would twist, displacing portions of the concrete, leaving important reinforcing rods exposed at most critical moments. Any mechanical protection needed should be held in position independently of the concrete and be placed against its outer face only.

Divisional walls relied upon as fire-stops in warehouses and similar buildings should not be less than 9 in. thick.

Some Examples.

In a fire test made in a reinforced concrete box on thick walls enclosing about 175 cubic ft. moisture was freely driven through the sides of the box, two of which were 6 in. thick and two 4 in. thick. The evaporation of this moisture kept the outer side of the concrete cool, but on the passage of moisture ceasing, which it did at the end of the test of forty-five minutes' duration, the outer surface of the concrete became very hot.

Combustible goods against a reinforced concrete wall less than 9 in. thick would be liable to ignition by heat from a fire burning on the opposite side of the wall.

With the kind permission of the executive of the British Fire-Prevention Committee, I am glad to be able to give a few photographic lantern views showing results following test with different classes of concrete and metal construction, in which all conditions are definitely recorded.

As you are all aware, the Fire-Prevention Committee's test are conducted under the Universal Standards of 1903, which require for classification, as affording "full protection" against fire, a fire test of four hours' duration (attaining 1,800 deg. Fahr.), followed by the application of water for five minutes from steam fire-engine to a floor measuring at least 200 ft. super., loaded with at least 2½ cwt. per ft. super.; whilst other classifications are obtainable, such as that of affording "partial protection" and "temporary protection" for lesser periods and under less stringent conditions.

According to these standards it will be observed how few of the examples I am presenting have obtained the highest classification, and it will also be observed that some of the examples presented are entire failures.

RESOLUTIONS PASSED AT THE INTERNATIONAL FIRE CONGRESS.

AT the recent International Fire Congress at Milan, the following resolutions were passed, which it will be seen embody points of considerable importance in regard to the protection of buildings from fire:—

"*Resolution I.—External Openings to Buildings.*

(*a*) That greater attention be accorded to the protection of vertical external openings to buildings than heretofore.

(*b*) That some approved means of protection be compulsory for all opposing windows having less than 8 ft. intervening, and for opposing windows in enclosed courts having less than 15 ft. intervening.

Resolution II.—Public Buildings.

That it is necessary to accord greater attention than heretofore to safety from fire in large public buildings, such as churches, museums, hospitals, colleges, etc.

Resolution III.—Reinforced Concrete.

(*a*) That no reinforced concrete construction should be permissible in buildings intended to be fire resisting unless the aggregate be most carefully selected and applied in such a manner as to give substantial protection to all metal parts.

That it is advisable where reinforced concrete is intended to be fire resisting that every portion of the metal rods or bars contained therein be covered by not less than 2 in. of concrete, the aggregate of which must be able to pass through a sieve of not more than 1 in. diameter, and that Portland cement of great firmness only be used.

(*b*) That where feasible all external angles should be rounded.

(*c*) Any angle iron needed for mechanical protection should be held in position independently of the concrete.

Resolution IV.—Motor Garages.

(*a*) That accommodation for motor-cars (motor garages) be not allowed under dwellings.

(*b*) That special measures for isolating motor garages from adjacent dwellings be adopted.

(*c*) That special measures be taken to avoid the possible access of benzine or petrol into the cellarage, drains, or sewerage system of buildings.

(*d*) That for the storage of small quantities of petrol or benzine the cans should be kept below ground level, but where a greater quantity be kept than can be easily removed by hand, a proper underground metal receptacle should be employed, from which the liquid could be extracted without the pressure of air."

THE ROYAL ACADEMY ARCHITECTURAL SCHOOL.

WE have been asked to give publicity to the following notice with reference to the Architectural School of the Royal Academy:—

"1. The Architectural School of the Royal Academy will from October 1 next be open five evenings in the week (Monday, Tuesday, Wednesday, Thursday, Friday) from 6 p.m. to 8 p.m., instead of, as now, three.

2. Applicants for admission to the school who can produce a certificate of fair proficiency from an institution for architectural education recognised by the Royal Academy, will be exempt from the necessity of showing the work required for the admission of probationers.

These institutions are:—The Royal College of Art; the Architectural Association; King's College, London; University College, London; Liverpool University; Manchester University. The list may be added to at the discretion of the President and Council.

3. The first date for the admission of probationers under this new system will be Tuesday, July 31 next, and the certificates, together with the printed form to be previously obtained from the Royal Academy and duly filled in, and the certificate of birth, must be delivered at the Royal Academy on Saturday, July 28 next.

The examination for the admission as students of the successful applicants will be held in October next. Any further information can be obtained on application at the Royal Academy."

THE ROYAL SANITARY INSTITUTE:

CONGRESS AT BRISTOL.

ON Monday the Autumn Congress of the Royal Sanitary Institute was opened at Bristol, and the sittings of sections, the lectures, and visits to places of public interest were continued during the week, and terminated to-day (Friday). On Monday morning the members and delegates were welcomed in the Council House by the Lord Mayor of Bristol (Mr. A. J. Smith), and a public luncheon in the Royal Hotel followed. Later in the day the Lord Mayor opened the Health Exhibition, which is held in the Drill Hall, and in the evening Sir Edward Fry delivered the inaugural address to the Congress in the Victoria Rooms. Amongst those attending the Congress were Fleet-Surgeon F. A. Jeans, representing the Admiralty; Mr. H. B. Woodward and Dr. A. Eicholz, from the Board of Education; Messrs. S. Lambert and W. F. Penfold, representing the Metropolitan Asylums Board; Col. H. E. R. James and Mr. W. C. Tyndale, from the War Office; and representatives from the Governments of Portugal, Sweden, and Turkey. Over 200 municipal and public bodies sent delegates, including the Architectural Association, British Medical Association, Civil and Mechanical Engineers' Society, Incorporated Association of Municipal and County Engineers, Royal Institute of British Architects, Rural Housing and Sanitation Association, etc.

In the evening the members of the Congress were received in the Victoria Rooms by the High Sheriff, when Sir Edward Fry gave an inaugural address.

Presidential Address.

Sir Edward Fry, in the course of his presidential address, touched on the progress of science, and remarked that one of the effects of an increase in scientific knowledge had been to increase the burthen of our duties, both as individuals and as citizens. And as was the fate of the individual, so is the fate of the municipality. The State rightly required of such bodies that they should make due provision for what was now called public health; that they should, at any rate, deliver their citizens from the dangers arising from the accumulation of putrefying matter and the contents of the drains. This had led to a vast amount of litigation, and to the onlooker at these contests there naturally arose the thought that a science which could admit of such a conflict of opinions must be in a more or less chaotic condition, and that much yet remained to be done before it could be considered to have reached the condition of an exact science or of an unfailing guide to those who wandered in ignorance and darkness. It was to such congresses as that that they looked to restore to them the peace they enjoyed in the days of their ignorance, and to make the new life not only more healthful than the old, but as full of repose and peace. He knew that the questions involved in sanitary science were many of them of much intricacy and difficulty, as well as of much interest; but they were confident that as those interested in the matter pursued their labours from year to year they would more and more approach to an exact knowledge of the matters which arise, and would thus afford a more and more certain guidance to a public who earnestly desired some uniformity of advice from those whom they trusted in such matters. Having referred to the ordinances of Menn, the Levitical laws of the Jews, and some passages of Hesiod where he enunciates some of the rules of rural life in Boatia some 700 or 800 B.C., Sir Edward said it was to the Romans and not to the Greeks that they looked for the first practical works of a sanitary kind, and their earliest structures were such as still to challenge our admiration and wonder. Probably no drainage operation ever had so mighty an influence on the world as the great works for the drainage of Rome, for the result of these works was not merely to carry away polluting matter, but to convert the low, swampy land lying in the midst of the hills of Rome into the solid ground on which the Forum Romanum was constructed, and thus to afford a common meeting-place for the inhabitants of the several communities

of the several hills of Rome, and so form the very home and nursery of the fierce Roman people from whence they went forth to conquer. A few months ago he visited in North Africa the remains of the town of Thamugus (now Timgad), built by Trajan, and not the least surprising thing in this magnificent city is the system of drains constructed down all the principal thoroughfares. The city, moreover, was abundantly furnished with magnificent baths and cisterns of water, and in the house of Faustus one still sees the bath-room, and on each side two pillars, one inscribed with the name of the god Æsculapius and the other with that of the goddess Hygeia, so consciously did the Romans in this remote spot recognise the duty of seeking after health. If Rome in her ignorance could do all this for herself and her remote provinces, what ought this country to do for herself and all the branches of her empire?

The Health Exhibition.

The Health Exhibition was housed in the Drill Hall, and about one hundred exhibits were shown. The following acted as judges: Mr. H. D. Searles Wood, Mr. H. Adams, Dr. P. Boobbyer, Mr. H. Pery Boulnois, Mr. T. W. Cutler, Mr. E T. Hall, Dr. L. C. Parkes, Dr. Geo. Reid, Mr. J. Osborne Smith, Mr. W. C. Tyndale, and Mr J. E. Wilcox. In the preliminary list of awards the following were awarded silver medals: W. M. Glover & Sons, Ltd., for new patern covered dust cart and for the Warmth sprinkler and flusher; the Horsfall Destructor Company, Ltd., for centrifugal dust catcher; Messrs Pocock Bros. for padded room fittings.

Bronze medals: Nevile Engineering Company, for Cainks jets and sprinklers; Constable & Son, for house refuse tip van; "England" Works, for steel portable cloak-room fittings; John Knight & Sons, for metal inspection covers with non-detachable fastenings, and for gully trap, etc.; W. Harriman & Co., for glazed fireclay ware twin sink and for channel bends for manholes; John Jones, for cast-iron inspection chamber and for cast-iron intercepting bottom for building into brick chamber; Doulton & Co., for non-concussive water mixing valve and also for glazed fireclay fireplaces; Freeman Hines, Ltd., for locking bricks; Candy & Co., Ltd., for glazed fireclay fireplaces; Pountney & Co., Ltd., for non-erosing semi-porcelain ware; Messrs. J. Duckett & Son, Ltd., for radial jointed trap outlet; Rowe Bros. & Co., Ltd., for lead pipes; Combination Collapsible Ventilator Company, for hopper ventilator with folding sides; and D. Smith, for combined expansion drain-testing plugs.

The following additional awards of bronze medals were subsequently announced: The Safety Water Elevator Company, for safety water elevator well gear; Messrs. Geo. Howson & Sons, Ltd., for mural bracket closet; Messrs. Doulton & Co., Ltd., for school urinal with vertical water check and flush riser to channel; Messrs. C. W. Outram & Co., Ltd., for the Hassell w.c. suite, with 1½ gals. flush; Messrs. Shanks & Co., Ltd., for bath with concave plinth, and also for adjustable vulcanite grill for bed-pan suite; and the Iron and Marble Company, for the Drawell register grate.

The following amongst other exhibits have been deferred for further trial and consideration: G. Percival Milnes, automatic apparatus for governing the supply and discharge in connection with contact filter beds, automatic apparatus for dosing sprinklers, and automatic flushing apparatus to discharge at varying intervals; George Howson & Sons, Ltd., automatic drop-by-drop flushing cistern and asylum safety bath with regulating valves; Edward Bennis & Co., Ltd., improved smokeless chain stoker; Doulton & Co., anti-scalding control apparatus for bath; McDougall Bros., disinfectants; H. Birch, Killon, & Co., Fiddian's distributor; British Fuel Economiser and Smoke Preventer Company, Bunsen bridge for boiler furnaces; Newton, Chambers, & Co., Ltd., disinfectants; Maughan's Patent Geyser Company, Ltd., geyser with safety gas valve; the Plastoment Asbestos Flooring Company—Plastoment asbestos flooring.

Visitors to the exhibition found inventions and appliances of all kinds which are intended to make the home more beautiful and more healthy, and to carry out present-day ideas of what is necessary for the disposal of unsavoury refuse and the prevention of disease. The Safety Meter Elevator Company were showing their safety-meter elevator, which raises water from any depth to the surface. Messrs. Doulton & Co. had two stands. In the corridor they were showing glazed fireclay stones and fireplaces, and in the main hall were two bath-rooms fitted up most invitingly, the one with a cast-iron white vitreous enamelled bath, wide-rolled edge, standing, waste, and lever valves, and the other with a cast-iron Sitz bath, white vitreous enamelled, with jet, wave, and spray fittings. The same company were also exhibiting other specimens of baths and a double range of fireclay trough lavatories, with spray supply, specially suitable for schools. Several of their pedestal and other closets suitable for houses, schools, and institutions were shown.

Amongst the stands specially interesting to surveyors were those of the Nevile Engineering Company, of Worcester, showing Caink's jets and sprinklers for street-watering carts; Messrs. Constable & Sons, of 1, Harrow-road, London, who had on view their latest improvement in house-refuse tip-vans, with sanitary cover-lids and wind-guards combined, as well as street orderly truck with sanitary cover-lids; that of the Bristol Wagon & Carriage Company, showing improved street-watering vans and new patent tipping dust van; and that of Messrs. W. M. Glover & Son, Ltd., who were showing their "Warwick" sprinkler and flusher fitted with lead and leather hose attachment, and the new pattern dust van. The Horsfell Destructor Company had models of their well-known destructor, both of the "back-fed" and "top-fed" types, as well as samples of crushed clinker and clinker bricks.

An interesting exhibit was that of Messrs. Murray & Co., of Preston, showing their automatic flood trap. Mr. G. P. Milnes, of Stroud, was exhibiting his three automatic apparatus for governing the supply and discharge in connexion with contact filter-beds and the like, and these are being tested by the judges. Messrs. John Knight & Sons, 24, Gertrude-street, Chelsea, S.W., were showing disconnecting chambers with intercepting trap, fitted with Knight's cover to chamber and access trap on cap. Amongst other things also being exhibited by the firm was the Aldwych double-seal manhole-cover, for which a bronze medal was awarded. Glazed fireclay, more sinks of various descriptions, together with cisterns, urinals, intercepting-traps, etc., made up a noticeable exhibit by Messrs. W. Harrison & Co., of Newcastle-upon-Tyne. Lavatory arrangements were also the exhibits of Mr. J. Jones, of the Carlyle Works, Chelsea.

Messrs. Freeman Hines, Ltd., of 2, Victoria-street, London, were showing their pipe-joint, which is now pretty well known. They were also showing Hines' locking-bricks for bacteria bed-wells, with which no cement or mortar is required. In close proximity to this exhibit was that of Messrs. Geo. Howson & Sons, of Hanley, who were displaying cisterns of all kinds, lavatories for hospitals, etc., closets, and many other sanitary fittings.

A distinct novelty was the natural sanitary water-closet, exhibited by the inventor, Mr. E. A. Rawlence, Salisbury. Messrs. H. Birch, Killon, & Co., of Manchester, were showing a working model of a bacterial filter of 4½ ft. diameter, fitted with Fiddian's distributor, and had a number of drawings and photographs of installations of all types of Fiddian's distributors. Messrs. W. & R. Leggott, of Bradford and London, showed devices for regulating roof-lights, lantern-lights, etc., for ventilation, as well as brass and other metal goods of all kinds. The British Fuel Economiser and Smoke Prevention Company, of Bedford-row, W.C., had a section of a boiler furnace showing the Bunsen bridge and apparatus for the prevention of smoke and economy in fuel by the introduction of highly-heated air in regulated quantities to all parts of the furnace. Mr. J. Hoskins, of the Warmley Pottery, had various stoneware pipes, gullies, traps, and interceptors on view, including Hoskins' open-inspection pipe-joint, and further, he was showing the "Smokure" chimney-pot and ventilator. Sanitary inspectors found much to interest them in the Spring Bending Company's (Handsworth) exhibit of drain-cleaners of different types.

Messrs. Candy & Co., Ltd., 87, Newman-street, W.C., were showing their several designs of "Devon" fireplaces, manufactured of fireclay backs, with glazed bricks and glazed hearths and kerbs to match. The Devon type is made in a large variety of type to suit any room in any building, and they were well spoken of by the Committee, who recently carried out tests for the Smoke Abatement Society in conjunction with H.M. Office of Works.

Another exhibit of considerable interest to a gathering of sanitary specialists was that of McDougall Bros., of Manchester, and 10, Mark-lane, E.C., who were showing sanitary appliances of various kinds, as well as disinfectant powders, fluids, soaps, etc. Messrs. Newton, Chambers, & Co., Ltd., of Thorncliffe, near Sheffield, had a capital exhibit of the well-known "Izal" preparations. Snowdon, Sons, & Co., Ltd., of London and Birmingham, were showing lubricators, electro fittings, disinfectants, etc.

Messrs. C. W. Outram & Co., of Woodville, made a speciality of the Hassall water-closet suites, fitted with Hassall's patent flushing rim. Messrs. Jas. Crispin & Sons, of Bristol, were showing boilers, radiators, calorifiers, steam traps, etc., and Messrs. Pountney & Co., Ltd., of the Bristol Potteries, were showing some porcelain lavatory basins in various sizes. The hand-painted decoration on some of the lavatory basins attracted considerable notice.

The Catleybrook Brick Company, of Bristol, made a most attractive exhibition of their blue and red vitrified bricks, terra-cotta, and moulded bricks, etc. The firm's bricks are being largely used for sewerage work in the west of England. A very large show of lavatories, closets, urinals, and fittings of all kinds was made by Messrs. J. Duckett & Sons, Ltd., of Burnley; while Messrs. Hughes & Stirling, of 7, Arundel-street, Strand, W.C., exhibited a model of a complete "Sterling" destructor, with boiler, flues, dust catcher, and chimney. Many photographs were also shown of installations of refuse destructors which have been carried out by the firm for local authorities. Probably the most noticeable exhibit to the visitor not specially connected with any branch of sanitation was that of Mr. P. E. Gane, of College Green, Bristol, who was showing a scheme of furniture and decoration for the dining-room and library of a modern house. Messrs. Shanks & Co., of Barrhead, had baths, urinals, water-closets, etc., of their own design on view, and another good exhibit of a similar nature was that of Rowe Bros. & Co., of Bristol.

In the West Hall the most noticeable exhibit was undoubtedly that of the Eagle Range and Gas Stove Company, of Birmingham and London, who were showing all kinds of ranges and grates in operation. The London Warming and Ventilating Company, of 20, Newman-street, London, had also an attractive display of grates, including the "Florence" patent warm air and ventilating grate in action, the "Everbrite," "Brilliant," "Economic Anthracite," and other stoves. In the same hall Maughan's Patent Geyser Company were showing various types of geysers.

Several heating and ventilating exhibits were also to be found in the East Hall, and these included the stand of Mr. J. D. Prior, of Birmingham, who was showing his patent heat distributor and the "Venetian" fire-grate; the Iron Marble Company, Ltd., of Bristol, who had various types of register grates and ranges on exhibition; Jas. Stott & Co., of Oldham and Birmingham, who were showing water heaters, reflex lights, automatic exhaust roof ventilators, and electric and motor-driven fans; and Messrs. Hendry & Patterson, Ltd., of 3, Taybridge-road, London, S.W., showing D. O. Boyd's "Hygiastic" warm-air ventilating grate. The Plastoment Asbestos Flooring Company, of Lamb's-passage, Bunhill-row, London, were also exhibiting in this hall the Plastoment asbestos flooring.

Engineers' and Surveyors' Conference.

Mr. H. Percy Boulnois, M.Inst.C.E., presided on Tuesday morning at the Bristol Blind Asylum over the Conference of Engineers and Surveyors to County and other Sanitary Authorities, and, in opening the proceedings, referred to the undoubted value of such Conferences, and remarked on the many changes

and advances made in many of the branches of engineering. With regard, for instance, to the much-discussed question of sewage disposal, since 1892 great changes in the methods adopted for purification have been made, and the bacterial processes had made great progress, though they were still some way off finality. The Chairman proceeded to deal with the various methods of the disposal of sewage, and said that, although great strides had been made in this branch of municipal engineering, much more remained for solution in this difficult and controversial subject. The proper housing of the labouring classes, both in urban and rural districts, was a problem which had not yet been satisfactorily solved, and it involved not only engineering but serious economic questions which were not easy of solution. Another question which loomed large in this perspective is that of the recent revolution in the description of the locomotion on the roads and streets by the introduction of motor-cars and traction engines, which had entirely altered the character of the traffic which the roads and streets were designed to carry. Whilst, on the other hand, their surfaces would not be subjected to the hard hammering of the horses' hoofs, they would be subject to a tearing, distintegrating action from the rapidly-revolving pneumatic tyres of the motor-car and to greatly increased weight of the traction engine and its accompanying loads. Further, there was the terrible nuisance of dust, which must be stopped before serious damage thereby is caused to persons and to property. The question of the economic supply of pure water to our villages and scattered houses was worthy of every engineer's attention, but, unfortunately, the cost was generally prohibitive. Concrete construction had made considerable progress since 1892, due to the introduction of the Hennibique patent process, and there was no doubt a large field open for this description of construction in many branches of engineering. The strength obtained by this fortified concrete had been remarkable, and it looked as if the text-books on the strength of this material would have to be revised. Progress was the watchword of every engineer, and it was especially so with the municipal engineer, as the eyes of the public were so constantly upon him, and he was subject to much criticism. There was no finality in engineering, and it behoved them who had the well-being of the country at heart to take advantage of everything that would help them to meet the difficulties which must ensue for the modern desire of the human race to aggregate together in large centres of population.

Construction and Maintenance of Rural Roads.

Mr. Robert Phillips (County Surveyor, Gloucestershire) gave his personal experience in constructing some thirty-five miles of road in England and in the direct maintenance for the past seventeen years of 1,050 miles of country main roads. He pointed out that the ideal road was a straight one, but this was not often obtainable. If the road was to be properly drained no part should be absolutely level. The most suitable gradient was 1 in 30. Experience had shown that a metalled surface of 18 ft. was required for rural main roads, and a width of 40 ft. between the fences, and in the neighbourhood of large towns these dimensions should be increased to 30 ft. and 60 ft. respectively. The construction of the road would depend on the material available in the neighbourhood. If hard clinkers of refuse from a destructor is to be used this would require to be 12 in. in depth and to be well rolled before the broken top metal was applied. The road bed would be 20 in. below the finished surface of the road, and should be curved to give a fall of 6 in. to 9 in. from the centre to the sides; where possible the finished road surface should be kept above the level of the adjoining land. If any bog, springs, or running sand is found below the road bed, it should be excavated, and 12 in. of clay puddle placed over it. If a troublesome yellow clay, that is sometimes found between the coal measures and the limestone, it should be trenched across every 3 yds., 2 ft. deep, and the trenches filled with ashes. Where the road is in cutting there should be at least 1 yd. of levelled surface between the metalled surface and the toe of the slope. The top metal should be of hard broken stone, not more than 2½ in. in its longest diagonal dimension, spread from the shovel to give an even surface of about 1 in 30 from the centre 4 in. thick; this will require 1 ton to every 8 yds. superficial, and when consolidated the top metal will be 3 in. in thickness. In all cases of thick coating use a profile mould to obtain a good cross section. If all the roads were constructed in this manner the duties of the surveyor would be light, but many were simply worn tracks which had been covered with macadam. His practice was to have the road scraped or swept clean before applying the fresh metal, the new material to be of the hardest obtainable, and to be broken by hand (on the roadside where possible) to a 2½-in. ring. Occasionally a 2-in. stone is used; the new metal to be kept as clean as possible, and spread one-stone thick, 1 ton to cover 12 superficial yds.; this to be dry steam rolled without any bindage till the stones are fixed, and then the smallest possible quantity of bindage. He stored the road-scrapings for this purpose in heaps till vegetation has decayed. With regard to the dust problem, the solution appeared to be the use of the hardest and heaviest stone procurable, to use as little bindage as possible, and perhaps to front it with pitch and tar before applying any bindage after it has been dry rolled.

Macadamised Roads and Dust.

Mr. A. P. I. Cotterell, M.Inst.C.E., in a paper on this subject, said it was nearly one hundred years since McAdam began to lay down the principles of road construction to which he had given his name, and there was an appropriateness in considering this topic at Bristol, for it was in this neighbourhood, in 1816, that Mr. McAdam, as Surveyor to the Bristol Turnpike Trust, first put in practice the methods that he advocated. In the days of Telford and McAdam the question of dust was probably of little account. One of the requirements of a macadamised road on which horse traffic is used was that it shall be slightly elastic. Theoretically an unyielding surface may be better for vehicles, but practically a considerable amount of wear would ensue both to the road and the vehicle unless the road surface was slightly responsive to any jar. This vital requirement of elasticity was really one of the chief causes of the trouble experienced with dust. It was generally said that motor-cars were the cause of the dust, but motor-cars would not raise the dust if the dust were not already there either on the surface or in the interstices of the metalling. It was better to get at the cause of the trouble than to blame the instrument, and the cause was undoubtedly the fine material that lies upon and between the metalling. There appeared to be three directions along which efforts may be made to reduce dust:—(*a*) By treating the macadamised surface in such a manner as to retard the formation of dust, or fix it when it is formed; (*b*) by introducing another substance as a cushion between the metalling in place of the grit and dust with which the interstices are usually filled; (*c*) to use as road material stone of a silicious or basaltic nature less liable to be broken down by wear or dissolved by moisture. With regard to (*a*), the City Engineer of Bristol had furnished the results of experiments as to the relative cost of dressing the roads with different dust-preventing solutions. The experiments took place in Coronation-road, Bedminster, and those who had formerly complained as to the street watering both spoke and wrote of the good results. No record was kept of the reduced cost of cleansing, but it was probable that there would be a saving as compared with ordinary street watering. In Liverpool experiments were made in treating the roads with oil, and apparently the treatment resulted in a distinct saving in maintenance as well as reduction of wear; but, on the other hand, the oil did not form a very pleasant surface for traffic, and the smell was complained of. It is probable that the trouble from dust can be very much palliated on existing roads by the use of calcium chloride and other similar solutions without appreciably increasing the cost of watering, if at all. On the other hand, the best way to make dustless roads is to use better material. A bad material can never be made permanently satisfactory by simply fixing the surface dust. (*b*) Treating the roads with a watering solution may be possible in urban, but, as a rule, it is altogether beyond the means of rural districts, and another method must be found. The dust nuisance has been successfully tackled by coating newly-rolled metalling with boiling tar and pitch. Immediately after the road is formed the tar and pitch is applied in a flat stream from a watering-pot. It is then dressed with fine flint grit and allowed to stand a day or two for consolidation before the traffic passes over it. Even with mendip limestone, which is notorious for giving off dust, this method has been found to be successful. Another example of the second way of overcoming the dust question is the use of tarred macadam. This has been tried for some years with more or less successful results. Tarred slag appears to have answered well in some of the busy thoroughfares of London. The tar, as in the previous case, is applied hot, the slag being also heated to dryness. Apparently better results have been obtained with slag than with limestone or basalt. This method will probably be followed up still further, and there can be no reason why, in course of time, it may not become uniformly successful. It appears to aim in the right direction of substituting for dust an elastic and non-friable material as a cushion between the stones. (*c*) Anyone who travels over the country will notice how much less dust there is where basaltic or silicious stone is used as compared with limestone, lias, or oolite. If every macadamised road could be made up with basalt the dust question would assume a very different aspect. It is not only that such roads are less easily broken down by weather, but the material being of greater specific gravity is not so easily moved by wind. The argument against the more general use of basalt, in districts remote from basaltic quarries, is its cost. But it does not necessarily follow that a material which is cheapest in first cost will be cheapest when the cost of maintenance is taken into account.

Mr. Fletcher (Dorset) opened the discussion, and said he found it better and cheaper to scarify. In Dorsetshire the cost of their main roads had increased in seventeen years from 12,000*l.* to 26,000*l.*, and he attributed that to traction engines. They could make the roads, but it was all a question of cost, and he thought either the Government would have to take over the main roads or else give them grants.

Mr. Read (Gloucester) pointed out that hundreds of roads had no artificial foundation, and this was a cause of a great deal of the difficulty.

Mr. C. E. Nichols (Folkestone) described what had been done at Folkestone with regard to the tar-painting of roads, and said it had been so successful that he intended to do all the roads of the town. It prevented dust, and was cheaper. He used ordinary tar with no addition.

Mr. Wheeler (Eastwood) also instanced some roads which had been treated with tar macadam which had been down four years and would last another five. The cost for two years worked out at 16s. 2d. for the tar macadam as against 24s. for granite.

Dr. Rideal remarked that the presence of even a small quantity of soluble alkali made a difference in the hardness of material. He suggested that the dust nuisance could be greatly removed in the country by cutting down the hedges. He thought in the use of cloude salts they might make it a sterilising solution as well as a dust-preventing solution.

Mr. Martin (Eastbourne) advocated the treatment of the roads with a thick coat of tar and pitch, and afterwards the spreading over of some well-slaked lime and then coarse sand or gravel.

Mr. H. Baldwin (Coalville) also advocated the addition of lime in the preparation of tar macadam.

Mr. Mawbey (Leicester) said that in days gone by he found that the addition of lime to the pitch and tar made a splendid damp course. They had tried calcide of chloride, but found it cost more than the watering although it kept the dust down.

Design of Works for the Bacterial Treatment of Sewage.

Mr. J. S. Pickering (Borough Engineer, Cheltenham) read a paper on this subject, in which he pointed out the necessity of

the overflow arrangements being adjusted to the varying flow of sewage. The ordinary fixed weir will, with a heavy head of storm-water, permit an excessive volume to pass to the works, and the type known as the "leap weir" was also unsatisfactory. A type of storm-water overflow not generally known, but far in advance of the usual forms adopted, was one having a separating plate fixed horizontally at weir level across the sewer. The quantity to be treated passes underneath this plate, and all in excess is deflected by a vertical plate into the overflow culvert. No storm-water overflow which did not take into account the fluctuating dry-weather flow of sewage could be considered entirely satisfactory. Some means should be adopted for preventing such objectionable matter as paper and other floating matter from entering the water-course. The author proceeded to give figures obtained from nearly a hundred works where the bacterial system is in operation, and pointed out that, where almost identical conditions prevailed, the practice of different engineers is so much at variance as to lead one to the only possible conclusion that in many points of detail the bacterial treatment of sewage has by no means passed the experimental stage. The author next dealt with screens, detritus tanks, sedimentation or septic tanks, filters, and land. He considered it necessary that sewage should be screened upon entering the works, but the design of the screens would depend somewhat on the character of the sewage and its subsequent treatment. He suggested that where shallow screens to be raked by hand are provided the total width should not be less than 9 in. per 1,000 population, to be dealt with to a minimum of, say, 5 ft. All road detritus and other mineral matter should be intercepted in properly-designed tanks, and, having freed the sewage of the greater part of the mineral matter, some form of tank treatment is necessary prior to its application to filter beds. If septic treatment was to be carried out he suggested that the tanks should be covered and thoroughly ventilated. Provided that suitable arrangements are made for removing some of the deposited sludge at frequent intervals, tanks of a capacity of three-fourths the dry-weather flow should be of ample size to effect the clarification and give any necessary septic action to the sewage. The question as to whether the tank effluent should be dealt with in contact-beds or continuous filters depended largely upon the levels of the site and other local conditions. Broadly speaking, the effluent from a percolation filter 6 ft. deep is equal in its standard of purification to an effluent of the same quality sewage from a double-contact system. He felt that a system of percolation filters will, as a rule, be much more economical, both in initial outlay and working expenses, than a system of double-contact beds. The permanent success of a filter depended largely on the use of a suitable filtering medium, and materials liable to disintegration should be avoided. He was of opinion that a very hard angular material, such as broken granite, will prove the most advantageous for use. Little information was forthcoming on the relative results of various sized materials, and until this is forthcoming it is difficult to arrive at a satisfactory conclusion. Great hopes were at one time entertained that the Royal Commission appointed eight years ago to deal with the subject of sewage purification would bring forward a final and satisfactory solution, but, so far, it has not been forthcoming, though some useful information may be obtained from the various reports issued. What appears to be required is a properly organised State Department, which would collect reliable information from works in operation and conduct trials and experiments at the expense of the nation for the guidance of sanitary authorities, who are now left to their own resources to find a solution of the sewage problem.

Considerable discussion followed the reading of this paper.

Mr. Upson (Maidenhead) doubted whether the author was correct in saying that they would get a liquefaction of 50 per cent. of the organic solids in a septic tank, and thought they would not be justified in placing the percentage higher than 25 per cent.

Mr. Read (Gloucester) thought that the proper place to intercept road detritus was at the street gulleys.

Mr. Smith (Kettering) spoke at some length on the necessity of more attention being paid in sewage works to the overflow weir, and thought that the weir might be combined with a detritus-chamber, and made to serve all purposes. He also expressed some doubt as to whether screens were necessary.

Mr. Lacy hoped that the final Report of the Royal Commission would assist engineers in determining to some extent what was the best of the varying systems of sewage disposal. He did not think that septic tanks gave rise to any nuisance which was perceptible outside the immediate proximity of the works.

Mr. Collins (Leicester) described how sludge was dealt with in that town by placing it in furrows and then ploughing it.

Dr. Rideal said it was extraordinary that although the Local Government Board requirements as to bacterial works were the same, yet there was such tremendous differences in actual practice. He agreed that screens, as a rule, were a mistake. If they could remove the detritus by rushing it through the detritus tank and then press it on to the land instead of using storm tanks, he thought it would be better.

Mr. Mawbey expressed the opinion that they ought to view the suggested abolition of screens with great caution. It might be all very well with gravitation schemes, but they could not do without them where they had to pump.

Mr. Pickering agreed with Mr. Upson that 50 per cent. of liquefaction was rather high, although experiments at York had actually shown 60 per cent. He agreed also that it would be well to intercept the detritus at the street gulleys, but believed a good deal would still get through. He was still of opinion that there were few cases where screens could not be done away with in spite of what had been said. Mr. Dibdin had designed slate beds to actually take the place of tanks, and he believed that that gentleman was working on right lines in trying to get a system of aerobic treatment.

Rational Extension of Modern Cities.

At the Conference of Municipal Representatives held at University College on Tuesday, Mr. A. Richardson, M.P., read a paper on this subject, and remarked that the abnormal growth of large towns and cities presented them with a great social problem—the proper housing of the working classes. The modern city in this country has been built up piecemeal and in patches without any regard for the artistic and with no attempt on a large scale to lay down building blocks for residences, separate areas for manufactories, wide central spaces for schools, institutes, theatres, churches, etc. The result is large slum areas, dwellings side by side with industrial works, *bona-fide* working men, in order to be near their employment, gradually accommodating themselves to the tenement system—all of which heavily handicap him in the race for bread and lower his moral vitality. In addition to these drawbacks in consequence of our system of rating and taxation municipal debts are accumulating at such a rate that they become increasingly heavy, and the pace we are travelling at in that direction is somewhat alarming. The efforts of reformers in the future, as taught by the above fact, must be of a twofold nature:—(*a*) To prevent the influx of village labourers into the cities, thus giving partial relief to the congestion; and (*b*) to secure big belts of land outside cities, but within reasonable distance of industrial works, for building purposes. One of the principal aims of the intelligent reformer is the prevention of the growth of slums in the future. Every thoughtful and intelligent man who has devoted any serious attention to the housing problem of our great cities must have realised that much of our cottage property put up in recent years, or now being built, will show very little superiority over the dwellings it displaces when it has been in existence as long as the latter. Faulty design, faulty material, faulty construction, and want of surrounding space all combine to render the houses but little better than their predecessors so far at any rate as the prospect of future fitness is concerned. Many of our municipalities and private owners know what ought to be done, and would be prepared to do it but for legal and departmental difficulties of an insuperable character standing in the way. Local authorities can now buy land either within or without their districts for the construction thereon of workmen's dwellings, but the houses must be built at once, and the purchase money, if obtained from Public Works Loan Commissioners, repaid within thirty years. What we require is the power to buy large tracts of prospective suburb before it has acquired the price of building land, such suburban area to be laid out on plan after careful and expert consideration, but only to be built upon when the need for new building arises, and then only in accordance with the pre-arranged plan. The roads should be wide, straight, and planted with trees, and should be arranged to intersect as far as possible at right angles. The area should be segmented, and certain definite sections set apart for certain definite and separate purposes, *e.g.*, one section should be for good-class residences, another for workmen's dwellings, another for factories of various kinds and suitable railway-sidings and depôts connected with them. Special attention should be paid to the question of provision of open spaces, municipal lungs, and specific sections of these parks and recreation grounds set apart and equipped for very young children Baths (swimming and washing) should not be forgotten in connexion with these. The minimum area allowed for these breathing spaces ought not to be less than one acre in ten. There should be no such thing as the intrusion of slaughtering establishments or other offensive trades into residential neighbourhoods. If we in this country were in a position to arrange for the future extension of our cities in this way we should be able to deal with the so-called housing problem of the times in a far more satisfactory manner than at present.

Engineering and Architecture.

The first sitting of the Engineering and Architecture Section was held at University College on Wednesday morning under the presidency of Mr. E. T. Hall.

The President, in his opening address, said he felt he could not address them with advantage on such subjects as sewage treatment, water supply, or river purification, or deal with the chemical, medical, and bacteriological problems with which they were intimately connected, but he could address some practical remarks on the best way of utilising in our buildings sunlight and air, the two best aids in the restoration of the sick to health and in the prevention of disease. In architecture, light and air exercise a potent influence, not only on exterior design but on the planning of buildings. He might be pardoned if he lay stress on the necessity of designing all kinds of buildings from within rather than from without. In other words, to take care that the exterior, so far as fenestration is concerned, shall express and grow out of the internal requirements of the building. To sacrifice the interior in order to get an external effect is insincerity in architecture. It means inconvenience to those who use the buildings, and results in unsanitary conditions prejudicial to body and mind. Appropriateness in design is the correct aim in art, and this arises where the design is the natural and ordered outcome of the purpose for which the building is intended. In the dwelling-house of the wealthy and middle class this principle of design is not so frequently overlooked, but it is not uncommon in towns, both in these and poorer dwellings, to see the neglect of such simple rules as that windows should be so disposed that all parts of a room shall be well illuminated, not only because light is the great germ-killer, but because it serves to point out impurities otherwise unnoticed; that the tops of windows shall be as near to the ceiling as possible, and that windows should be made to open wide, so that all parts of the room may be scoured by currents of fresh air. Through ventilation of rooms and buildings is a gain of great importance, and we must see that other provision than that of open windows is made for the entrance of fresh air and for the exit of foul air, and to this end we should provide inlet ventilation of a simple type and outlets into upcast flues. Having referred to the block-planning of large buildings, such as hospitals and schools, the President said that this open-plan type

brought him to the mention of sanatoria, which are not merely the temporary abodes of consumptive patients, but are great colleges of hygiene. The architect must make the sanitorium a model, an object of what a sanitary building should be. He must lay out his scheme on broad lines, and design to give all the rooms a maximum of sunlight. Everywhere facilities for cleanliness must be evident—cleanliness of the habitation and of the person. He could not but think that the public guardians of the health of the poor in towns might follow the precedent set in country sanatoria, and he would suggest that our large hospitals under private management might specially fit up some parts of their noble institutions and become schools of hygiene in a very special sense. Further, he urged that the ventilation of schools should be done by the natural system of open windows and of warming fresh air brought directly into the classrooms. Children are keen observers, and if they are taught in schools where the windows are never open they will go home and think that windows ought not to be opened. In the planning of schools a word of caution was needed. It had been the practice of the last twenty years to design schools with a large central assembly hall, but it should be separated entirely from the side classrooms by well ventilated and naturally-aerated corridors parallel to the sides of the hall. He thought also in such a hall an artificial or forced system of air-supply is almost a necessity. Passing to the question of the smoke-laden atmosphere of large towns, the President said he was not so unpractical as to run a tilt against the open fireplace for sitting-rooms, but, on the contrary, he was an advocate for such fireplaces. He could not think, however, that science is impotent to invent some simple apparatus to arrest and utilise the whole of the fuel used and save those products of combustion which now go to waste. The kitchen range, which was the great smoke-producer, might be done away with and gas or electricity substituted. In factories he thought the coal furnace and the tall chimney may in the relatively near future be entirely done away with for the substitution of electricity. In public buildings, like hotels and similar institutions, and in large boarding-schools, we can, however, all do our share towards smoke abatement. In bedrooms, for example, fireplaces for coal consumption should be done away with, and hot-water pipes and radiators substituted, with, of course, good ventilation. He had adopted this system in all the nurses' houses of his recent hospitals, and its advantages are obvious. Dealing next with the subject of rural by-laws and their effect on the housing of the poor, Mr. Hall said it was reasonable to insist on damp courses in the walls, on preventing ground air from passing into rooms, on sound drainage and its ventilation, and on preventing water pollution, but beyond these essentials a great many of the present requirements for cottages are not only unnecessary, but are deterrent of building. From housing the workman to housing those who were past work is a natural transition, and he asked if it could not be possible to grade our houses for the indigent classes. As architects, they could assist the authorities in the design of buildings suitable to different classes. Attempts had been made to classify inmates of the present poorhouses, but he suggested the classification of the houses themselves. After briefly alluding to the use of steel in building construction, the President urged that they should press on the public at large to take care that new buildings shall be worthy of our towns and cities; that there shall be a real desire to get good architecture to adorn their streets. The Royal Institute of British Architects has been earnestly striving for many years to raise the standard of the practitioners of our art by enforcing thorough training, by making the examinations for young architects sound tests of knowledge; but many men (particularly in the provinces) evade these and hold aloof from our organisation on the ground that it is useless for them to toil, because the incompetent man, unequipped by study and having no claim to the title of architect which he assumes, receives the employment which his local friends secure for him without inquiry as to whether the representative body of architects have given him their diploma or not. May we hope that the Institute's efforts will receive the cordial support of all public-minded men, because then we may be sure the standard of architectural art in the public mind will be raised, and competent men alone will be commissioned to see to the adornment of the great centres of industry, of liberty, and of throbbing life, which are the glory of our country.

On the motion of Mr. Woodward (Board of Education), seconded by Mr. Whittaker, a vote of thanks was passed to the President.

Isolated Homes for the Aged Poor.

Mr. A. Saxon Snell read a paper on "Isolated Homes for the Aged Poor *v.* the Workhouse." Having dealt with the historical part of the subject, he said they would agree that better treatment was needed for those who had drifted to the workhouse by force of circumstances beyond their control. It was for this class that isolated or cottage homes are proposed, and have been in some cases erected, and he thought there could be no question as to their being an improvement on associated wards, subject to an exception for the case of those who are too old and feeble to attend to their daily wants without assistance. After all, the cottage home is a modified reversion to the principle of the almshouse—that institution which took shape some centuries ago, and lasts till this day in all parts of the country. The question to be asked is, can they be built, maintained, and administered at a reasonable cost, a cost per inmate, at any rate, not exceeding that which obtains in a workhouse? There are, unfortunately, no data of the cost of administration to go upon as yet, but if he might venture to express an opinion, for whatever little it may be worth, he thought that it was quite possible. If they were content to build just a little beyond what the poor had been used to, he felt that they could build such cottages cheaply. In a large institution they wanted a great number of officers, and elaborate heating apparatus, lighting, and fire-prevention apparatus; but in cottages they would not want that. Mr. Snell exhibited a plan of suggested cottages, which, allowing three inmates in each room or tenement, or twelve in each cottage, would accommodate seventy-two old men. Each tenement comprises a sitting-room, the bed cubicles being curtained off during the day. To each is attached a small scullery and food cupboard. There is a small porch with a seat in it, and this forms an inglenook by the fireplace which would be very cosy. The sanitary conveniences would be grouped together and screened off by trees, &c. Each room has a fireplace with a small range and oven, which would be used by the inmates in preparing their own breakfast and tea. No hot water would be laid on either to the sink or lavatory basin. The kettle would have to be brought into requisition for such a luxury, which, by the way, is denied to the vast majority of those who live outside the workhouse. The administrative block or cottage should also be designed on the most economical lines. The cost of these cottages, worked out on the basis of 6d. per foot, amounts to 316*l*., or 44*l*. per inmate. The administrative blocks, drainage, fencing, &c., would bring up the cost to between 60*l*. and 70*l*. per inmate.

Miss Cochrane pleaded that consideration should be given for the rural poor, and instanced sad cases of old people turned out of their homes and having to go to the workhouse.

Mr. Harding Roberts pointed out that there was nothing gained in the villages by taking a person from his own home to another home. They had better give the person sufficient outdoor relief to enable him to live in his own cottage. Even if they had the homes suggested by Mr. Snell they would still need the workhouses.

Utilisation of Pits, etc., for Rubbish.

Mr. H. B. Woodward, F.R.S., followed with a paper on "The Utilisation of Old Pits and Quarries and of Cliffs for the Reception of Rubbish," and said that it had been the custom to utilise abandoned pits for the reception of town refuse. The evils likely to result from the process, when dwelling-houses are afterwards erected on the tracts, have been sufficiently recognised, and the law now exercises its protective influence. The pollution of building sites is not, however, the only objection that should be raised to the indiscriminate infilling of pits and quarries. In many parts of the country picturesque heaths and commons, places that may be regarded as natural health resorts, have been defiled by the shooting of rubbish into old gravel or clay pits or stone quarries. Moreover, the material—glass and crockery, sharp fragments of metal, as well as dust and decomposing organic matter—is apt to be scattered on ground bordering the abandoned pits. From an æsthetic point of view this is deplorable; but the rubbish is not only unsightly, it is unwholesome from the ill odours that arise, and dangerous from the wounds that may be inflicted, especially on children. But further than this, the geologist is naturally concerned at the way in which the water-bearing strata are rendered liable to contamination from the practice of shooting parish refuse into old chalk pits, limestone quarries, or gravel pits. When the local supply of drinking water is drawn from shallow wells in the adjacent strata, the danger of pollution may be serious. In many places around our sea coast, cliffs have been appropriated for the tipping of rubbish, and there is a lamentable pollution of the foreshore in many a picturesque locality adjacent to fishing and other villages. The author pointed out, in conclusion, that the only method of the final disposal of refuse was by fire.

Mr. Cotterell pointed out that some law was needed to prevent pollution of the water supply, and, as a matter of fact, it was the local authorities themselves who were generally the offenders.

Mr. Whittaker gave several instances of the disposal of sewage by local authorities near the wells of water companies, and urged that such things should be put a stop to.

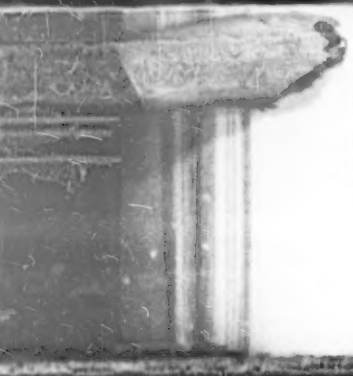
Mr. Woodward moved a resolution to the effect that the by-law of the Stroud District Council dealing with the disposal of rubbish should be brought before the Council of the Sanitary Institute with a view to their making representations to the Local Government Board.

The resolution was carried.

Bacterial Treatment of Sewage.

Mr. Stuart H. Davies brought the subject of the bacterial treatment of sewage before the section, and drew particular attention to the following points:—(*a*) Residence in tanks as a means of equalising sewage or as a preparation for further treatment; (*b*) sludge reduction; (*c*) the arrestment of suspended or irreducible matters. In attempts to arrive at better results by the aid of such guidance as the present state of imperfect knowledge affords, it appeared necessary to keep the following aims in view:—(*a*) The collection and concentration of sludge without undue interruptions to the flow of sewage; (*b*) the more effectual arrestment of suspended matters, and the avoidance of clogging, by improved methods of working rather than by elaboration in design; (*c*) the resolution of sludge under an aerobic condition as productive of less offence and more rapid treatment. In connexion with these aims the claims of trickling filters and contact beds, relatively or in combination, together with methods of working, as best calculated to overcome the difficulties met with, must be considered. As a means of securing rapidity of treatment, the value of trickling beds is evident. Analyses of sludge taken from beds have frequently revealed the fact that matter has been carried forward (by accelerated flow and by the activity taking place in tanks) which should have been deposited, and removed from grit chambers. The difficulty of holding back such matter does not arise in connexion with schemes which simply aim at the sedimentation of suspended matter as a preliminary to removal, but, apart from such schemes, it would appear desirable to aim at the more effectual arrestment of inorganic material by a uniform rate of flow.

Variation in flow is particularly objectionable in connexion with detritus tanks. He suggested that a uniform rate of flow under varying discharges can and should be attained by adapting the form of tank to such requirement. A tank to fulfil this purpose would be of considerable width and shallow depth, and would necessitate the construction



bers, & Co., Ltd., disinfectants; Maughan's Patent Geyser Company, Ltd., geyser with safety gas valve; the Plastoment Asbestos Flooring Company—Plastoment asbestos flooring.

Visitors to the exhibition found inventions and appliances of all kinds which are intended to make the home more beautiful and more healthy, and to carry out present-day ideas of what is necessary for the disposal of

[illegible] highly heated air in regulated quantities to all parts of the furnace. Mr. J. Hoskins, of the Warmley Pottery, had various stoneware pipes, gullies, traps, and interceptors on view, including Hoskins' open-inspection pipe-joint, and further, he was showing the "Smokure" chimney-pot and ventilator. Sanitary inspectors found much to interest them in the Spring Bending Company's (Handsworth) exhibit of drain-cleaners of different types.

[illegible] also exhibiting in this hall the Plastoment asbestos flooring.

Engineers' and Surveyors' Conference.

Mr. H. Percy Boulnois, M.Inst.C.E., presided on Tuesday morning at the Bristol Blind Asylum over the Conference of Engineers and Surveyors to County and other Sanitary Authorities, and, in opening the proceedings, referred to the undoubted value of such Conferences, and remarked on the many [illegible]

springs of running water is found below the road bed, it should be excavated, and 12 in. of clay puddle placed over it. If a troublesome yellow clay, that is sometimes found between the coal measures and the limestone, it should be trenched across every 3 yds., 2 ft. deep, and the trenches filled with ashes. Where the road is in cutting there should be at least 1 yd. of levelled surface between the metalled surface and the toe of the slope.

very pleasant surface for traffic, and the smell was complained of. It is probable that the trouble from dust can be very much palliated on existing roads by the use of calcium chloride and other similar solutions without appreciably increasing the cost of watering, if at all. On the other hand, the best way to make dustless roads is to use better material. A bad material can never be made permanently satisfactory by simply

to the pitch and tar made a splendid damp course. They had tried calcide of chloride, but found it cost more than the watering although it kept the dust down.

Design of Works for the Bacterial Treatment of Sewage.

Mr. J. S. Pickering (Borough Engineer, Cheltenham) read a paper on this subject, in which he pointed out the necessity of

the overflow arrangements being adjusted to the varying flow of sewage. The ordinary fixed weir will, with a heavy head of storm-water, permit an excessive volume to pass to the works, and the type known as the "leap weir" was also unsatisfactory. A type of storm-water overflow not generally known, but far in advance of the usual forms adopted, was one having a separating plate fixed horizontally at weir level across the sewer. The quantity to be treated passes underneath this plate, and all in excess is deflected by a vertical plate into the overflow culvert. No storm-water overflow which did not take into account the fluctuating dry-weather flow of sewage could be considered entirely satisfactory. Some means should be adopted for preventing such objectionable matter as paper and other floating matter from entering the water-course. The author proceeded to give figures obtained from nearly a hundred works where the bacterial system is in operation, and pointed out that, where almost identical conditions prevailed, the practice of different engineers is so much at variance as to lead one to the only possible conclusion that in many points of detail the bacterial treatment of sewage has by no means passed the experimental stage. The author next dealt with screens, detritus tanks, sedimentation or septic tanks, filters, and land. He considered it necessary that sewage should be screened upon entering the works, but the design of the screens would depend somewhat on the character of the sewage and its subsequent treatment. He suggested that where shallow screens to be raked by hand are provided the total width should not be less than 9 in. per 1,000 population, to be dealt with to a minimum of, say, 5 ft. All road detritus and other mineral matter should be intercepted in properly-designed tanks, and, having freed the sewage of the greater part of the mineral matter, some form of tank treatment is necessary prior to its application to filter beds. If septic treatment was to be carried out he suggested that the tanks should be covered and thoroughly ventilated. Provided that suitable arrangements are made for removing some of the deposited sludge at frequent intervals, tanks of a capacity of three-fourths the dry-weather flow should be of ample size to effect the clarification and give any necessary septic action to the sewage. The question as to whether the tank effluent should be dealt with in contact-beds or continuous filters depended largely upon the levels of the site and other local conditions. Broadly speaking, the effluent from a percolation filter 6 ft. deep is equal in its standard of purification to an effluent of the same quality sewage from a double-contact system. He felt that a system of percolation filters will, as a rule, be much more economical, both in initial outlay and working expenses, than a system of double-contact beds. The permanent success of a filter depended largely on the use of a suitable filtering medium, and materials liable to disintegration should be avoided. He was of opinion that a very hard angular material, such as broken granite, will prove the most advantageous for use. Little information was forthcoming on the relative results of various sized materials, and until this is forthcoming it is difficult to arrive at a satisfactory conclusion. Great hopes were at one time entertained that the Royal Commission appointed eight years ago to deal with the subject of sewage purification would bring forward a final and satisfactory solution, but, so far, it has not been forthcoming, though some useful information may be obtained from the various reports issued. What appears to be required is a properly organised State Department, which would collect reliable information from works in operation and conduct trials and experiments at the expense of the nation for the guidance of sanitary authorities, who are now left to their own resources to find a solution of the sewage problem.

Considerable discussion followed the reading of this paper.

Mr. Upson (Maidenhead) doubted whether the author was correct in saying that they would get a liquefaction of 50 per cent. of the organic solids in a septic tank, and thought they would not be justified in placing the percentage higher than 25 per cent.

Mr. Read (Gloucester) thought that the proper place to intercept road detritus was at the street gulleys.

Mr. Smith (Kettering) spoke at some length on the necessity of more attention being paid in sewage works to the overflow weir, and thought that the weir might be combined with a detritus-chamber, and made to serve all purposes. He also expressed some doubt as to whether screens were necessary.

Mr. Lacy hoped that the final Report of the Royal Commission would assist engineers in determining to some extent what was the best of the varying systems of sewage disposal. He did not think that septic tanks gave rise to any nuisance which was perceptible outside the immediate proximity of the works.

Mr. Collins (Leicester) described how sludge was dealt with in that town by placing it in furrows and then ploughing it.

Dr. Rideal said it was extraordinary that although the Local Government Board requirements as to bacterial works were the same, yet there was such tremendous differences in actual practice. He agreed that screens, as a rule, were a mistake. If they could remove the detritus by rushing it through the detritus tank and then press it on to the land instead of using storm tanks, he thought it would be better.

Mr. Mawbey expressed the opinion that they ought to view the suggested abolition of screens with great caution. It might be all very well with gravitation schemes, but they could not do without them where they had to pump.

Mr. Pickering agreed with Mr. Upson that 50 per cent. of liquefaction was rather high, although experiments at York had actually shown 60 per cent. He agreed also that it would be well to intercept the detritus at the street gulleys, but believed a good deal would still get through. He was still of opinion that there were few cases where screens could not be done away with in spite of what had been said. Mr. Dibdin had designed slate beds to actually take the place of tanks, and he believed that that gentleman was working on right lines in trying to get a system of aerobic treatment.

Rational Extension of Modern Cities.

At the Conference of Municipal Representatives held at University College on Tuesday, Mr. A. Richardson, M.P., read a paper on this subject, and remarked that the abnormal growth of large towns and cities presented them with a great social problem—the proper housing of the working classes. The modern city in this country has been built up piecemeal and in patches without any regard for the artistic and with no attempt on a large scale to lay down building blocks for residences, separate areas for manufactories, wide central spaces for schools, institutes, theatres, churches, etc. The result is large slum areas, dwellings side by side with industrial works, *bona-fide* working men, in order to be near their employment, gradually accommodating themselves to the tenement system—all of which heavily handicap him in the race for bread and lower his moral vitality. In addition to these drawbacks in consequence of our system of rating and taxation municipal debts are accumulating at such a rate that they become increasingly heavy, and the pace we are travelling at in that direction is somewhat alarming. The efforts of reformers in the future, as taught by the above fact, must be of a twofold nature:—(*a*) To prevent the influx of village labourers into the cities, thus giving partial relief to the congestion; and (*b*) to secure big belts of land outside cities, but within reasonable distance of industrial works, for building purposes. One of the principal aims of the intelligent reformer is the prevention of the growth of slums in the future. Every thoughtful and intelligent man who has devoted any serious attention to the housing problem of our great cities must have realised that much of our cottage property put up in recent years, or now being built, will show very little superiority over the dwellings it displaces when it has been in existence as long as the latter. Faulty design, faulty material, faulty construction, and want of surrounding space all combine to render the houses but little better than their predecessors so far at any rate as the prospect of future fitness is concerned. Many of our municipalities and private owners know what ought to be done, and would be prepared to do it but for legal and departmental difficulties of an insuperable character standing in the way. Local authorities can now buy land either within or without their districts for the construction thereon of workmen's dwellings, but the houses must be built at once, and the purchase money, if obtained from Public Works Loan Commissioners, repaid within thirty years. What we require is the power to buy large tracts of prospective suburb before it has acquired the price of building land, such suburban area to be laid out on plan after careful and expert consideration, but only to be built upon when the need for new building arises, and then only in accordance with the pre-arranged plan. The roads should be wide, straight, and planted with trees, and should be arranged to intersect as far as possible at right angles. The area should be segmented, and certain definite sections set apart for certain definite and separate purposes, *e.g.*, one section should be for good-class residences, another for workmen's dwellings, another for factories of various kinds and suitable railway-sidings and depôts connected with them. Special attention should be paid to the question of provision of open spaces, municipal lungs, and specific sections of these parks and recreation grounds set apart and equipped for very young children. Baths (swimming and washing) should not be forgotten in connexion with these. The minimum area allowed for these breathing spaces ought not to be less than one acre in ten. There should be no such thing as the intrusion of slaughtering establishments or other offensive trades into residential neighbourhoods. If we in this country were in a position to arrange for the future extension of our cities in this way we should be able to deal with the so-called housing problem of the times in a far more satisfactory manner than at present.

Engineering and Architecture.

The first sitting of the Engineering and Architecture Section was held at University College on Wednesday morning under the presidency of Mr. E. T. Hall.

The President, in his opening address, said he felt he could not address them with advantage on such subjects as sewage treatment, water supply, or river purification, or deal with the chemical, medical, and bacteriological problems with which they were intimately connected, but he could address some practical remarks on the best way of utilising in our buildings sunlight and air, the two best aids in the restoration of the sick to health and in the prevention of disease. In architecture, light and air exercise a potent influence, not only on exterior design but on the planning of buildings. He might be pardoned if he lay stress on the necessity of designing all kinds of buildings from within rather than from without. In other words, to take care that the exterior, so far as fenestration is concerned, shall express and grow out of the internal requirements of the building. To sacrifice the interior in order to get an external effect is insincerity in architecture. It means inconvenience to those who use the buildings, and results in unsanitary conditions prejudicial to body and mind. Appropriateness in design is the correct aim in art, and this arises where the design is the natural and ordered outcome of the purpose for which the building is intended. In the dwelling-house of the wealthy and middle class this principle of design is not so frequently overlooked, but it is not uncommon in towns, both in these and poorer dwellings, to see the neglect of such simple rules as that windows should be so disposed that all parts of a room shall be well illuminated, not only because light is the great germ-killer, but because it serves to point out impurities otherwise unnoticed; that the tops of windows shall be as near to the ceiling as possible, and that windows should be made to open wide, so that all parts of the room may be scoured by currents of fresh air. Through ventilation of rooms and buildings is a gain of great importance, and we must see that other provision than that of open windows is made for the entrance of fresh air and for the exit of foul air, and to this end we should provide inlet ventilation of a simple type and outlets into upcast flues. Having referred to the block-planning of large buildings, such as hospitals and schools, the President said that this open-plan type

brought him to the mention of sanatoria, which are not merely the temporary abodes of consumptive patients, but are great colleges of hygiene. The architect must make the sanitorium a model, an object of what a sanitary building should be. He must lay out his scheme on broad lines, and design to give all the rooms a maximum of sunlight. Everywhere facilities for cleanliness must be evident—cleanliness of the habitation and of the person. He could not but think that the public guardians of the health of the poor in towns might follow the precedent set in country sanatoria, and he would suggest that our large hospitals under private management might specially fit up some parts of their noble institutions and become schools of hygiene in a very special sense. Further, he urged that the ventilation of schools should be done by the natural system of open windows and of warming fresh air brought directly into the classrooms. Children are keen observers, and if they are taught in schools where the windows are never open they will go home and think that windows ought not to be opened. In the planning of schools a word of caution was needed. It had been the practice of the last twenty years to design schools with a large central assembly hall, but it should be separated entirely from the side classrooms by well ventilated and naturally-aerated corridors parallel to the sides of the hall. He thought also in such a hall an artificial or forced system of air-supply is almost a necessity. Passing to the question of the smoke-laden atmosphere of large towns, the President said he was not so unpractical as to run a tilt against the open fireplace for sitting-rooms, but, on the contrary, he was an advocate for such fireplaces. He could not think, however, that science is impotent to invent some simple apparatus to arrest and utilise the whole of the fuel used and save those products of combustion which now go to waste. The kitchen range, which was the great smoke-producer, might be done away with and gas or electricity substituted. In factories he thought the coal furnace and the tall chimney may in the relatively near future be entirely done away with for the substitution of electricity. In public buildings, like hotels and similar institutions, and in large boarding-schools, we can, however, all do our share towards smoke abatement. In bedrooms, for example, fireplaces for coal consumption should be done away with, and hot-water pipes and radiators substituted, with, of course, good ventilation. He had adopted this system in all the nurses' houses of his recent hospitals, and its advantages are obvious. Dealing next with the subject of rural by-laws and their effect on the housing of the poor, Mr. Hall said it was reasonable to insist on damp courses in the walls, on preventing ground air from passing into rooms, on sound drainage and its ventilation, and on preventing water pollution, but beyond these essentials a great many of the present requirements for cottages are not only unnecessary, but are deterrent of building. From housing the workman to housing those who were past work is a natural transition, and he asked if it could not be possible to grade our houses for the indigent classes. As architects, they could assist the authorities in the design of buildings suitable to different classes. Attempts had been made to classify inmates of the present poorhouses, but he suggested the classification of the houses themselves. After briefly alluding to the use of steel in building construction, the President urged that they should press on the public at large to take care that new buildings shall be worthy of our towns and cities; that there shall be a real desire to get good architecture to adorn their streets. The Royal Institute of British Architects has been earnestly striving for many years to raise the standard of the practitioners of our art by enforcing thorough training, by making the examinations for young architects sound tests of knowledge; but many men (particularly in the provinces) evade these and hold aloof from our organisation on the ground that it is useless for them to toil, because the incompetent man, unequipped by study and having no claim to the title of architect which he assumes, receives the employment which his local friends secure for him without inquiry as to whether the representative body of architects have given him their diploma or not. May we hope that the Institute's efforts will receive the cordial support of all public-minded men, because then we may be sure the standard of architectural art in the public mind will be raised, and competent men alone will be commissioned to see to the adornment of the great centres of industry, of liberty, and of throbbing life, which are the glory of our country.

On the motion of Mr. Woodward (Board of Education), seconded by Mr. Whittaker, a vote of thanks was passed to the President.

Isolated Homes for the Aged Poor.

Mr. A. Saxon Snell read a paper on "Isolated Homes for the Aged Poor *v.* the Workhouse." Having dealt with the historical part of the subject, he said they would agree that better treatment was needed for those who had drifted to the workhouse by force of circumstances beyond their control. It was for this class that isolated or cottage homes are proposed, and have been in some cases erected, and he thought there could be no question as to their being an improvement on associated wards, subject to an exception for the case of those who are too old and feeble to attend to their daily wants without assistance. After all, the cottage home is a modified reversion to the principle of the almshouse—that institution which took shape some centuries ago, and lasts till this day in all parts of the country. The question to be asked is, can they be built, maintained, and administered at a reasonable cost, a cost per inmate, at any rate, not exceeding that which obtains in a workhouse? There are, unfortunately, no data of the cost of administration to go upon as yet, but if he might venture to express an opinion, for whatever little it may be worth, he thought that it was quite possible. If they were content to build just a little beyond what the poor had been used to, he felt that they could build such cottages cheaply. In a large institution they wanted a great number of officers, and elaborate heating apparatus, lighting, and fire-prevention apparatus; but in cottages they would not want that. Mr. Snell exhibited a plan of suggested cottages, which, allowing three inmates in each room or tenement, or twelve in each cottage, would accommodate seventy-two old men. Each tenement comprises a sitting-room, the bed cubicles being curtained off during the day. To each is attached a small scullery and food cupboard. There is a small porch with a seat in it, and this forms an inglenook by the fireplace which would be very cosy. The sanitary conveniences would be grouped together and screened off by trees, &c. Each room has a fireplace with a small range and oven, which would be used by the inmates in preparing their own breakfast and tea. No hot water would be laid on either to the sink or lavatory basin. The kettle would have to be brought into requisition for such a luxury, which, by the way, is denied to the vast majority of those who live outside the workhouse. The administrative block or cottage should also be designed on the most economical lines. The cost of these cottages, worked out on the basis of 6d. per foot, amounts to 3160*l.*, or 44*l.* per inmate. The administrative blocks, drainage, fencing, &c., would bring up the cost to between 60*l.* and 70*l.* per inmate.

Miss Cochrane pleaded that consideration should be given for the rural poor, and instanced sad cases of old people turned out of their homes and having to go to the workhouse.

Mr. Harding Roberts pointed out that there was nothing gained in the villages by taking a person from his own home to another home. They had better give the person sufficient outdoor relief to enable him to live in his own cottage. Even if they had the homes suggested by Mr. Snell they would still need the workhouses.

Utilisation of Pits, etc., for Rubbish.

Mr. H. B. Woodward, F.R.S., followed with a paper on "The Utilisation of Old Pits and Quarries and of Cliffs for the Reception of Rubbish," and said that it had been the custom to utilise abandoned pits for the reception of town refuse. The evils likely to result from the process, when dwelling-houses are afterwards erected on the tracts, have been sufficiently recognised, and the law now exercises its protective influence. The pollution of building sites is not, however, the only objection that should be raised to the indiscriminate infilling of pits and quarries. In many parts of the country picturesque heaths and commons, places that may be regarded as natural health resorts, have been defiled by the shooting of rubbish into old gravel or clay pits or stone quarries. Moreover, the material—glass and crockery, sharp fragments of metal, as well as dust and decomposing organic matter—is apt to be scattered on ground bordering the abandoned pits. From an æsthetic point of view this is deplorable; but the rubbish is not only unsightly, it is unwholesome from the ill odours that arise, and dangerous from the wounds that may be inflicted, especially on children. But further than this, the geologist is naturally concerned at the way in which the water-bearing strata are rendered liable to contamination from the practice of shooting parish refuse into old chalk pits, limestone quarries, or gravel pits. When the local supply of drinking water is drawn from shallow wells in the adjacent strata, the danger of pollution may be serious. In many places around our sea coast, cliffs have been appropriated for the tipping of rubbish, and there is a lamentable pollution of the foreshore in many a picturesque locality adjacent to fishing and other villages. The author pointed out, in conclusion, that the only method of the final disposal of refuse was by fire.

Mr. Cotterell pointed out that some law was needed to prevent pollution of the water supply, and, as a matter of fact, it was the local authorities themselves who were generally the offenders.

Mr. Whittaker gave several instances of the disposal of sewage by local authorities near the wells of water companies, and urged that such things should be put a stop to.

Mr. Woodward moved a resolution to the effect that the by-law of the Stroud District Council dealing with the disposal of rubbish should be brought before the Council of the Sanitary Institute with a view to their making representations to the Local Government Board.

The resolution was carried.

Bacterial Treatment of Sewage.

Mr. Stuart H. Davies brought the subject of the bacterial treatment of sewage before the section, and drew particular attention to the following points:—(*a*) Residence in tanks as a means of equalising sewage or as a preparation for further treatment; (*b*) sludge reduction; (*c*) the arrestment of suspended or irreducible matters. In attempts to arrive at better results by the aid of such guidance as the present state of imperfect knowledge affords, it appeared necessary to keep the following aims in view:—(*a*) The collection and concentration of sludge without undue interruptions to the flow of sewage; (*b*) the more effectual arrestment of suspended matters, and the avoidance of clogging, by improved methods of working rather than by elaboration in design; (*c*) the resolution of sludge under an aerobic condition as productive of less offence and more rapid treatment. In connexion with these aims the claims of trickling filters and contact beds, relatively or in combination, together with methods of working, as best calculated to overcome the difficulties met with, must be considered. As a means of securing rapidity of treatment, the value of trickling beds is evident. Analyses of sludge taken from beds have frequently revealed the fact that matter has been carried forward (by accelerated flow and by the activity taking place in tanks) which should have been deposited, and removed from grit chambers. The difficulty of holding back such matter does not arise in connexion with schemes which simply aim at the sedimentation of suspended matter as a preliminary to removal, but, apart from such schemes, it would appear desirable to aim at the more effectual arrestment of inorganic material by a uniform rate of flow.

Variation in flow is particularly objectionable in connexion with detritus tanks. He suggested that a uniform rate of flow under varying discharges can and should be attained by adapting the form of tank to such requirement. A tank to fulfil this purpose would be of considerable width and shallow depth, and would necessitate the construction

of a stepped weir at the outlet end, but in a tank of this form the height of flow would at any time afford an indication of the quantity of sewage to be dealt with on beds and the greatest possible head would at all times be available, and while the cost of construction and labour in cleaning must be greater than that in connexion with some forms of tank, the advantages gained would seem to justify such expenditure, the ill-effects of imperfect design in this particular being felt more or less throughout the process of treatment. In the case of large tanks he suggested the possibility of emptying from below, screw-down valves being placed at intervals in the floor of the tank.

Experimental Coke Clinker Filter Beds.

Mr. Douglas Archibald gave the life history of eight years of the experimental coke clinker filter beds at Kingston-on-Thames, which he illustrated by a number of diagrams. The coke bed at Kingston, after eight years' continuous working, with scarcely a single day's rest and often no attention to, or cleansing, except on one occasion, is now receiving and dealing with no less than eight fillings a day of the Kingston tank effluent at the special request of the Royal Commission, and is giving an average purification of about 61 per cent., as reckoned by the analyses of albuminoid ammonia.

Dr. Rideal said it was unfortunate that, as engineers and surveyors, they could not use the figures which Mr. Archibald had given because, in all these problems, they had the Local Government Board to contend with, and they had to submit to their particular "flow pure," which negatived any practical conclusions which could be drawn from the results which Mr. Archibald had put before them. He questioned also whether the "flow pure," as measured by the albuminoid ammonia, was, after all, a real "flow pure." With regard to Mr. Davies's paper, he might say the question of the detritus tank had been discussed in another section, and it had been agreed that the inorganic detritus should be removed from the organic matter; the smaller the size of the detritus tank the better it was to prevent the accumulaion of organic solids at that stage. They all knew that sceptic tanks or chemical tanks required some method for the removal of sludge from the bottom, and now such sludge could be automatically removed without emptying the tank. It was, he believed, the general opinion that the sludge they had to deal with by modern bacterial methods was not so offensive as that they used to deal with, and it might be that this removed, to some extent, the sludge problem. A special problem to be considered at the present time was the airial nuisance arising from the distribution of effluents on the filters, and in this connexion he deprecated the use of the nozzle distributor. In the case of circular or rectangular distributors he thought they made many of the sprinklers much too high.

Dr. Reid thought that Mr. Davies was approaching the conclusion that many of them had arrived at, that percolating filters were much to be preferred to contact beds. At present Mr. Davies suggested a combination, but that would mean having another tank. The speaker proceeded to compare results obtained at Hanley with those obtained by Mr. Archibald.

Mr. A. J. Martin remarked that, in his experience, he had no difficulty in keeping down everything which could legitimately be called detritus in a tank which would hold from ten to twenty minutes' flow. He was not at all sure that they would not get clogging of the filters even if they succeeded in keeping back every particle of suspended matter in the effluent, because his observation led him to think that a great deal of the clogging was due to the absorbed matter in the effluent. Growths would take place in the filter where the effluent was apparently clean. To the best of his knowledge Mr. Archibald was justified in claiming for Kingston a record in the number of fillings a day, for he knew of no place where the contact beds were filled eight times a day. It was a very creditable record, and he trusted that the Local Government Board would take note of it, and that they would see some relaxation of those hard-and-fast regulations to which Dr. Rideal had referred.

The section then adjourned till Thursday.

Architectural Societies.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—This Association held on Saturday its annual excursion, when the members visited Tulliallan and Culross. The party, which numbered upwards of fifty, was met and welcomed by Sir Jas. Sivewright at Tulliallan and shown by him over the modern castle and gardens. The party then proceeded to the old castle, where Mr. Harold O. Tarbolton, F.R.I.B.A., read a short paper. After inspecting the castle, the members were entertained to luncheon by Sir Jas. Sivewright in the old banqueting hall. At the conclusion of the luncheon Sir James gave the toast of the Association, to which Mr. H. O. Tarbolton, president, replied, and thanked Sir James for his hospitality. Thereafter the party drove to Culross, where they visited the palace by permission of Miss Luke, and the Abbey Church and the Abbey House by permission of the Rev. David Hampton and Lord Bruce respectively. In the absence of Sir R. Rowand Anderson, Mr. A. F. Balfour Paul, architect, acted as leader at the palace and abbey.

Illustrations.

THE ARMSTRONG COLLEGE.

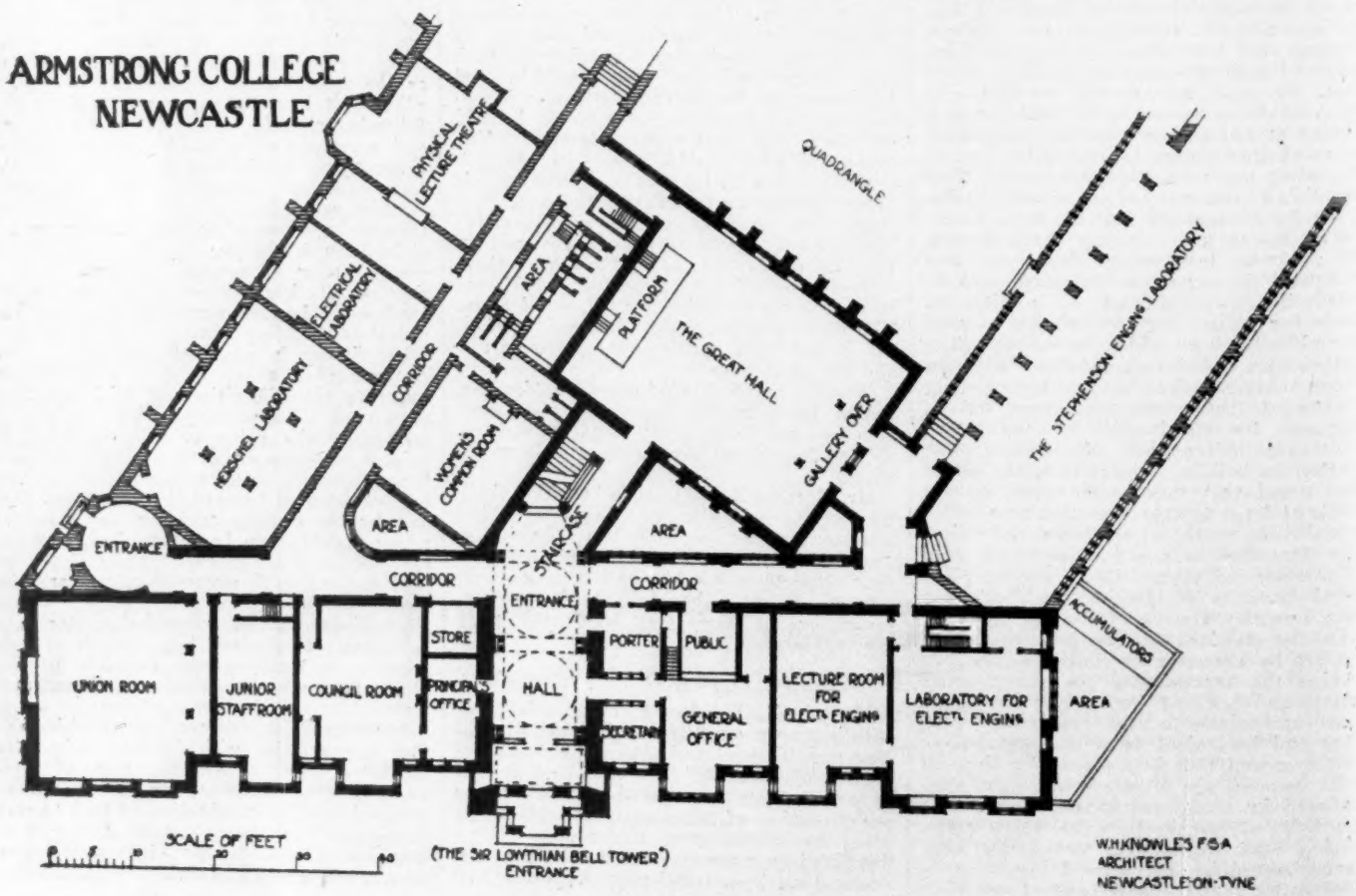
WE are able to give, by the courtesy of the architect, Mr. W. H. Knowles, tolerably full illustrations of the Armstrong College at Newcastle-upon-Tyne, which has just been opened by the King. These include an exterior view taken from the architect's drawing, and views of a part of the front, showing the principal entrance, and of the great hall, the council room, and the principal's room: these are taken from photographs. The plan is annexed.

The building was so fully described in our issue of June 30 (page 733 *et seq.*) that it is not necessary to say any more here.

SCULPTURE AT THE ROYAL ACADEMY.

WE have combined in some illustration plates of this issue, numbered consecutively for reference, all the photographs of sculpture at the Royal Academy which have been lent to us by artists who are exhibiting in the Octagon and the Lecture-room.

They are all referred to and commented on in the article on another page specially devoted to the subject. The only information we need add here is that in Mr. Schenck's relief, "Justice," the figures on each side represent "Poetry" and "Prose," and that the work forms part of the interior decoration in the Public Library, Hammersmith.



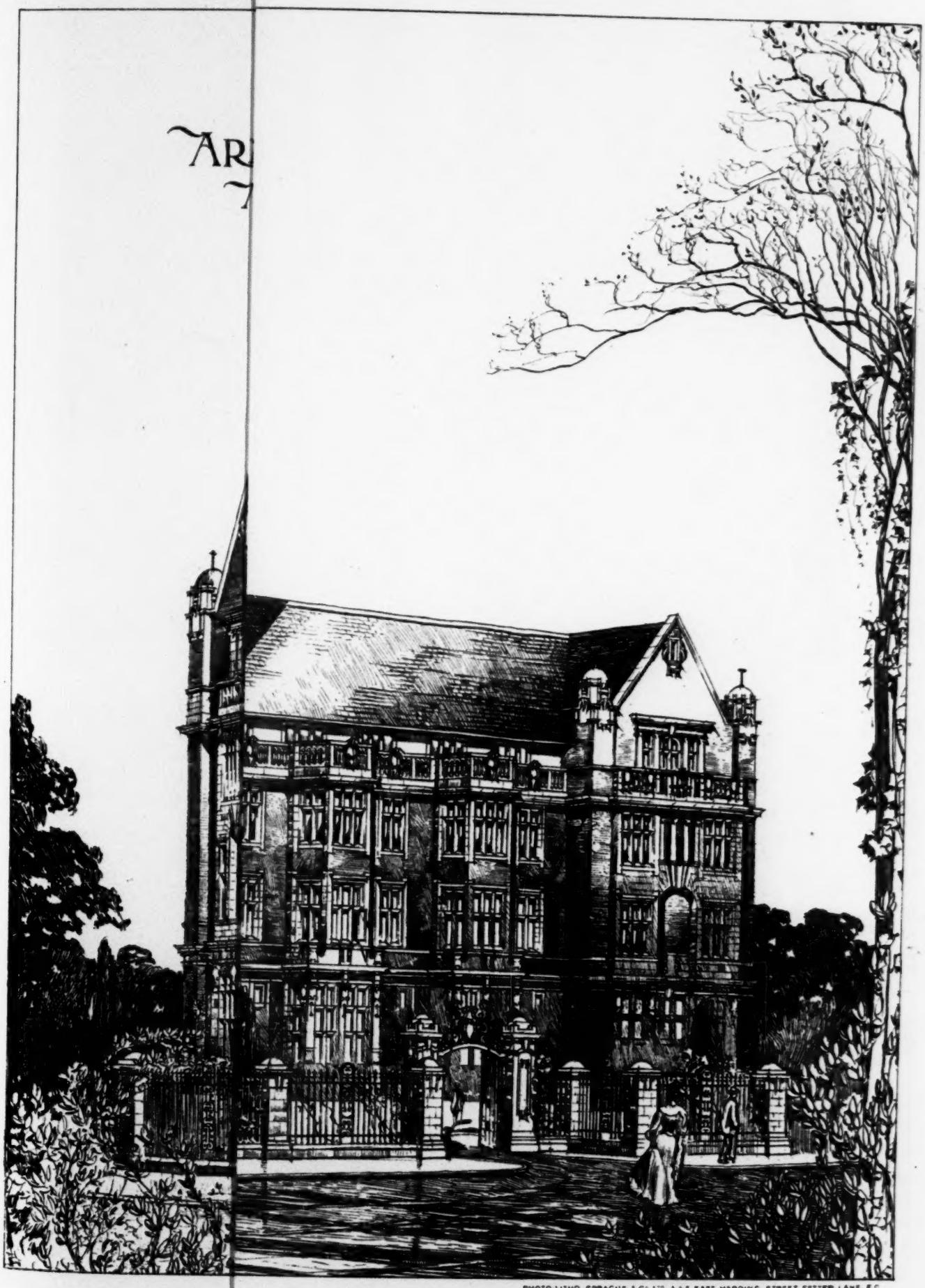


PHOTO LITHO. SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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Societies.

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wright at Tulliallan
e modern castle and
proceeded to the old castle, where Mr. Harold O. Tarbolton, F.R.I.B.A., read a short paper. After inspecting the castle, the members were entertained to luncheon by Sir Jas. Sivewright in the old banqueting hall. At the conclusion of the luncheon Sir James gave the toast of the Association, to which Mr. H. O. Tarbolton, president, replied, and thanked Sir James for his hospitality. Thereafter the party drove to Culross, where they visited the palace by permission of Miss Luke, and the Abbey Church and the Abbey House by permission of the Rev. David Hampton and Lord Bruce respectively. In the absence of Sir R. Rowand Anderson, Mr. A. F. Balfour Paul, architect, acted as leader at the palace and abbey.

Illustrations.

THE ARMSTRONG COLLEGE.

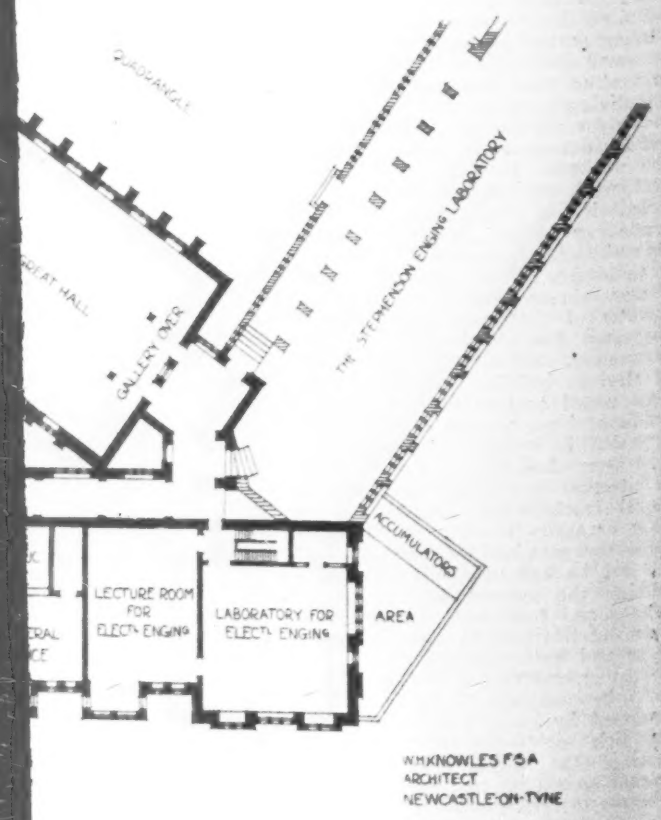
WE are able to give, by the courtesy of the architect, Mr. W. H. Knowles, tolerably full illustrations of the Armstrong College at Newcastle-upon-Tyne, which has just been opened by the King. These include an exterior view taken from the architect's drawing, and views of a part of the front, showing the principal entrance, and of the great hall, the council room, and the principal's room: these are taken from photographs. The plan is annexed.

The building was so fully described in our issue of June 30 (page 733 *et seq.*) that it is not necessary to say any more here.

SCULPTURE AT THE ROYAL ACADEMY.

WE have combined in some illustration plates of this issue, numbered consecutively for reference, all the photographs of sculpture at the Royal Academy which have been lent to us by artists who are exhibiting in the Octagon and the Lecture-room.

They are all referred to and commented on in the article on another page specially devoted to the subject. The only information we need add here is that in Mr. Schenck's relief, "Justice," the figures on each side represent "Poetry" and "Prose," and that the work forms part of the interior decoration in the Public Library, Hammersmith.



ARMSTRONG COLLEGE.

NEWCASTLE *upon* TYNE.

W.H. KNOWLES F.S.A.

Architect.

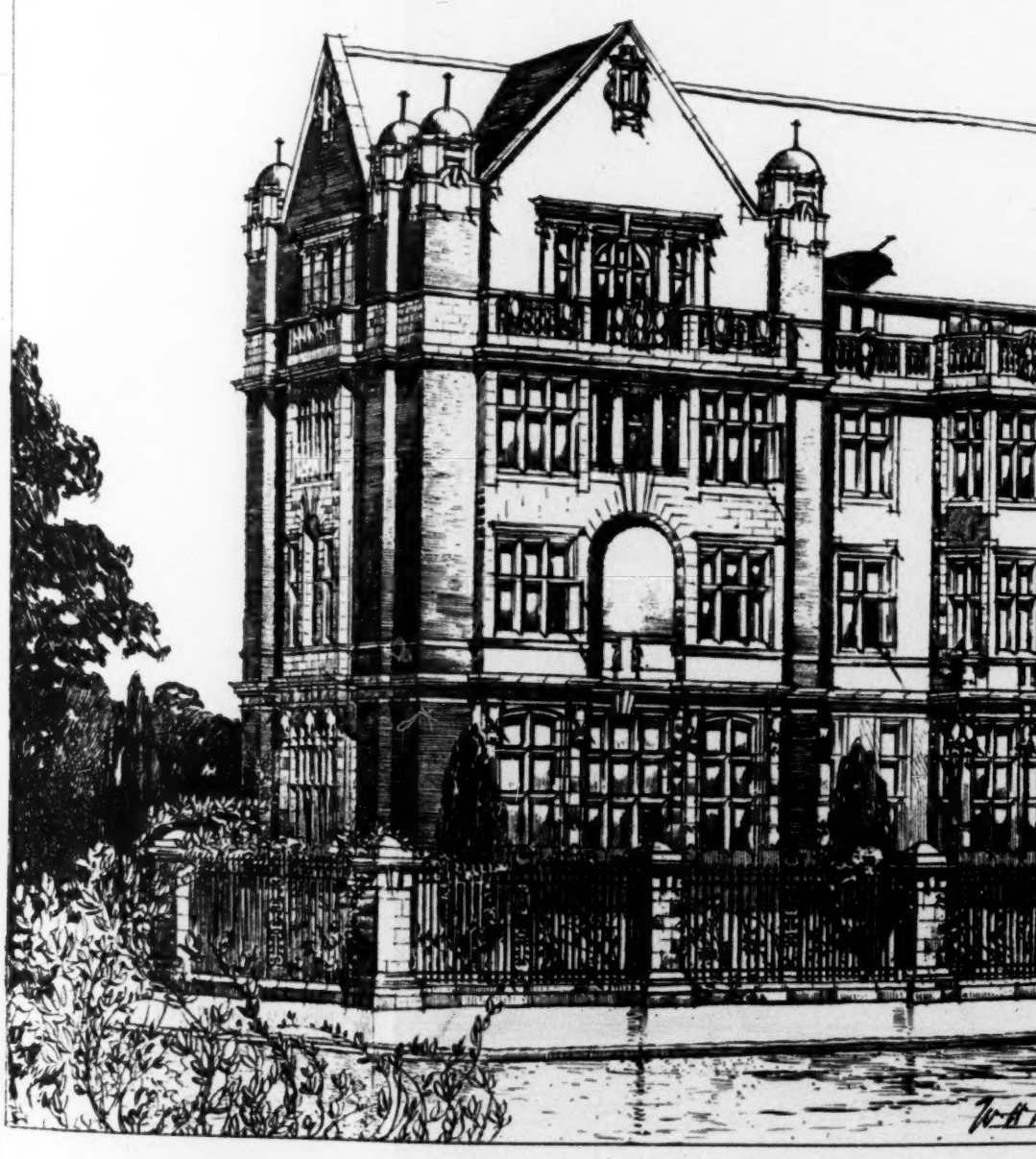
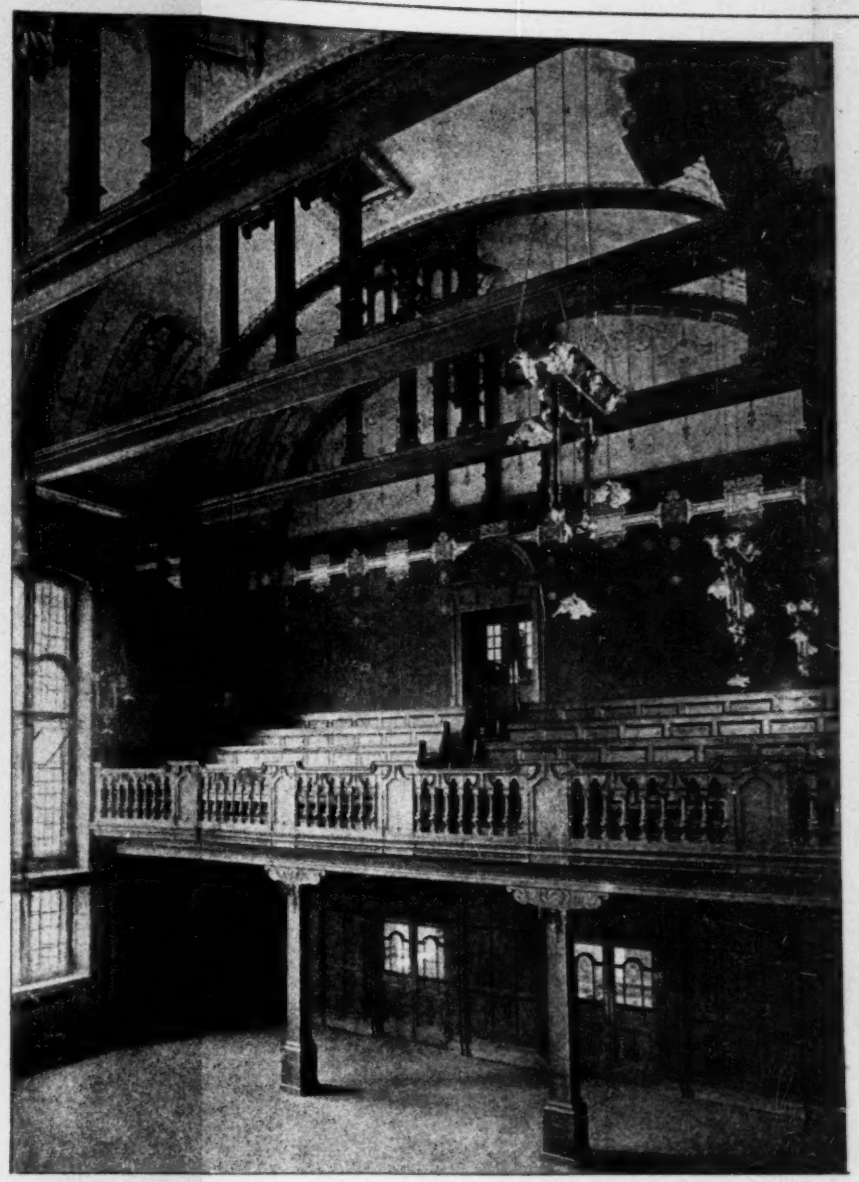


PHOTO LITHO SPRAGUE & Co LTD 4 5 5 EAST HARDING STREET FETTER LANE, E.C.

PRINCIPAL ENTRANCE.

THE COUNCIL ROOM.

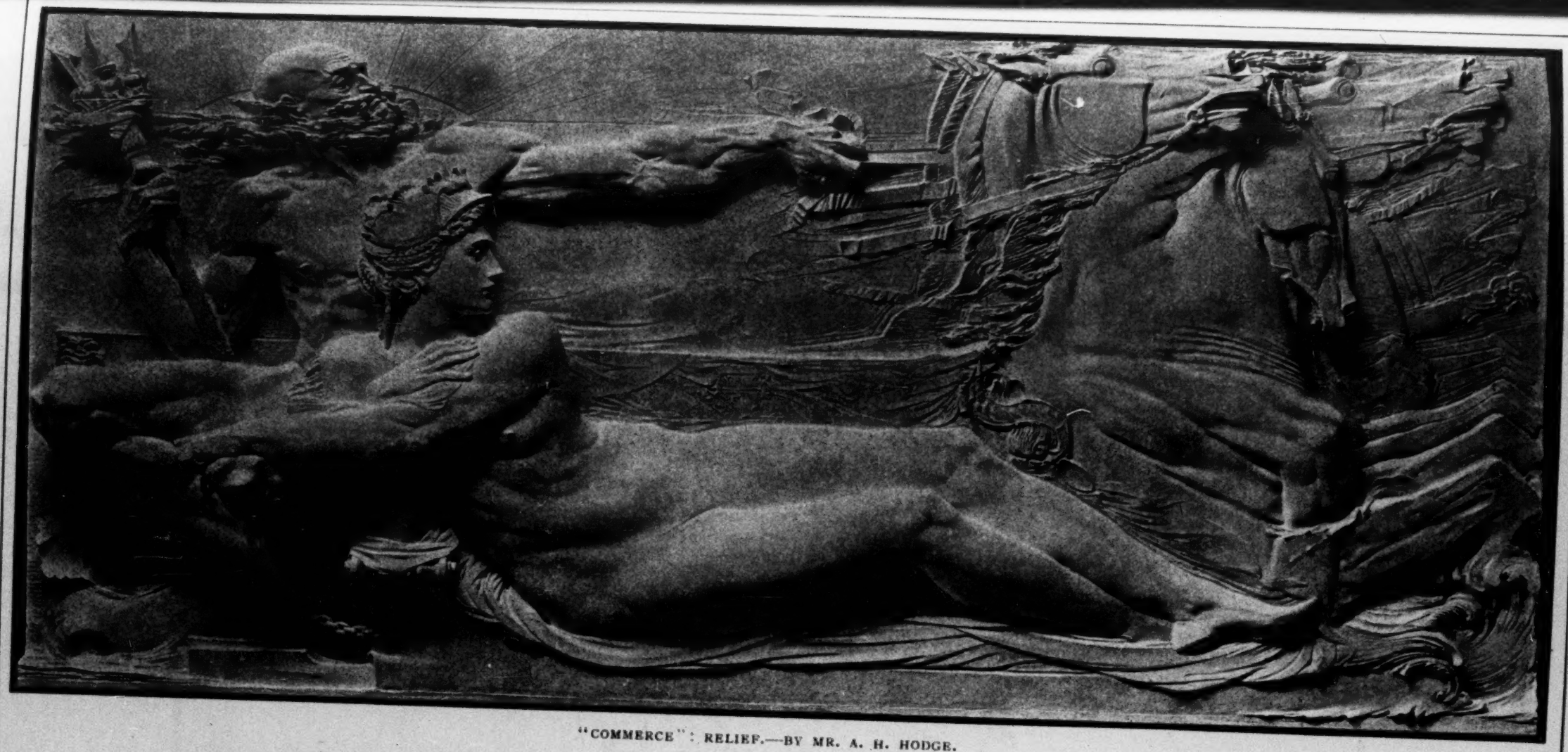


THE GREAT HALL.

THE PRINCIPAL'S ROOM.

"INK-PHOTO" SPRAGUE & Co LTD 4 & 5 EASTHARDING STREET FETTER LANE E.C.

STRONG COLLEGE, NEWCASTLE-UPON-TYNE.—Mr. W. H. Knowles, F.R.I.B.A., F.S.A., Architect.



"COMMERCE": RELIEF.—BY MR. A. H. HODGE.

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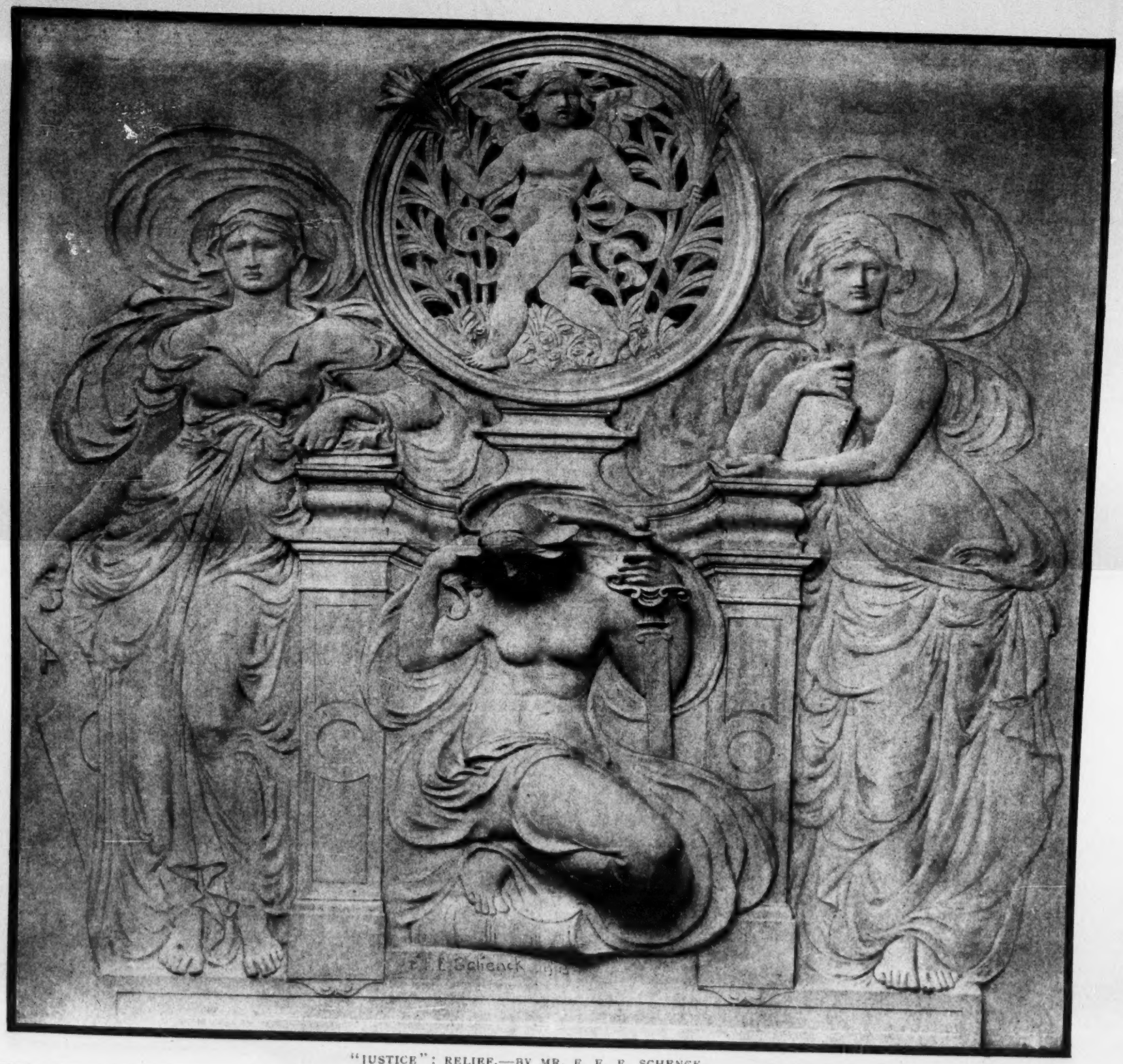
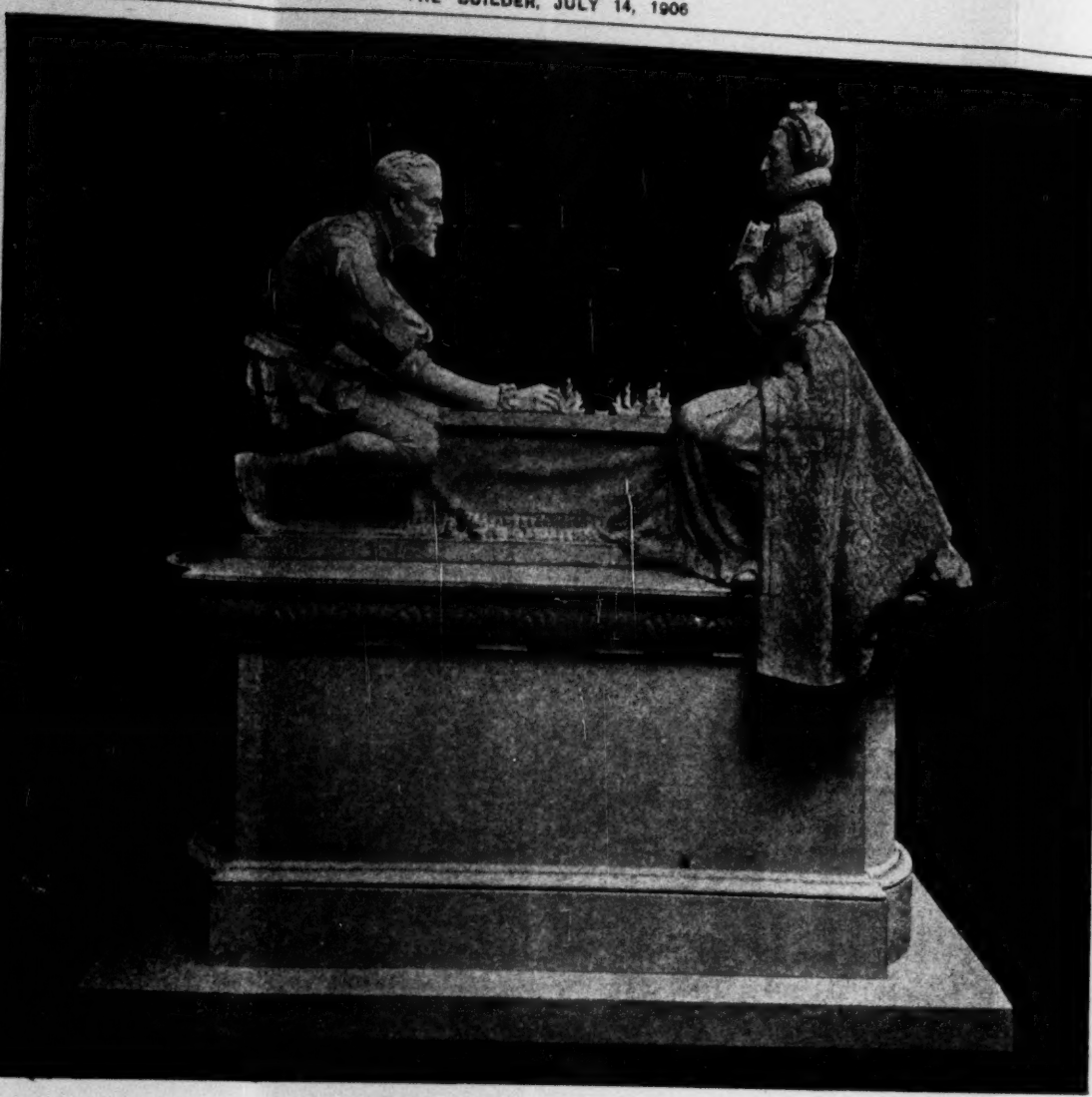


"JUSTICE": RELIEF.—BY MR. F. E. E. SCHENCK.

INK PHOTO SPRAGUE & C° LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

"MADONNA AND CHILD."—BY MR. BERTRAM MACKENNAL.



"A ROYAL GAME": AN ALLEGORY.—BY MR. W. REYNOLDS-STEPHENS.

"NARCISSUS."—BY MR. A. BERTRAM PEGRAM.

"PAX": RELIEF.—BY MR. OLIVER WHEATLEY.

"INK-PHOTO" SPRAGUE & Co. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

SCULPTURE AT THE ROYAL ACADEMY.—II.

"ABUNDANCE."—BY MR. F. DERWENT WOOD.

"ORPHEUS."—BY MR. HERBERT HAMPTON.

"THE CHILDREN OF THE SCULPTOR."—BY MR. ALBERT TOFT.

"WAR."—BY MR. BERTRAM MACKENNAL.

INK PHOTO SPRAGUE & C° L^TD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. Alderman Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed that the following loans be granted: To Battersea Borough Council 5,066*l.* for paving footpaths; to Camberwell Borough Council 725*l.* for housing purposes; and to St. Pancras Borough Council 6,203*l.* for street improvement.

White Hart-lane Estate—Finishing of Roadways on Section A.—The Housing of the Working Classes Committee recommended and it was agreed:

"That additional expenditure on capital account not exceeding 900*l.* be sanctioned in respect of the paving of the footways on sect. A of the White Hart-lane estate; that the offer of Mr. E. J. Knifton to provide and lay "Patent Victoria" stone and to make up the footways required for 6*s.* a square yard be accepted."

Mare-street—Sale of Land.—The Improvements Committee recommended that a freehold interest in a site in Mare-street be sold for 2,500*l.* to the governors of the Cripplegate Schools Foundation. This was agreed to after discussion and the defeat of an amendment.

List of Rates of Wages and Hours of Labour.—The Works Committee recommended that the Council's list of rates of wages and hours of labour be amended so as to provide that the rate of wages of drivers of Scotch derricks shall be 9½d. an hour. This was agreed to.

Housing, Islington: Burns, Knox, Scott, and Wallace Buildings.—The Housing of the Working Classes Committee reported that four blocks of dwellings, named Burns, Knox, Scott, and Wallace buildings, on the Caledonian Estate, Islington, are almost completed. The dwellings contain accommodation for 1,032 persons in four tenements of four rooms, 116 tenements of three rooms, and seventy-six tenements of two rooms. The Caledonian Estate, which was formerly the site of the Royal Caledonian Asylum, was acquired by the Council for the purpose of providing working class dwellings under Part III. of the Housing of the Working Classes Act, 1890. The total number of persons for whom accommodation will ultimately be provided on the estate is 1,388.

Displacements of Persons of the Working Class.—They also reported as follows:

"In continuation of previous reports on the subject of the displacement of persons of the working class in connexion with the development of private property, we desire to draw attention to clearances effected or about to be carried out in the metropolitan borough of Chelsea. About 200 houses bounded by Green-street, Rawling-street, Little Orford-street, and Marlborough-road have been acquired by a company with a view to the redevelopment of the property. The buildings are occupied by 1,024 persons of the working class, who will be displaced as the houses are required for demolition, an undertaking having been given by the company that the displacement will be carried on gradually during 1906 and the two years following, and that each tenant will receive not less than four months' notice to leave.

The leases of the majority of the houses standing on an area bounded on three sides by College-street, Leader-street, and Pond-place, and adjoining a block of working-class dwellings known as Onslow-dwellings, will fall in during 1907, and the land is now being offered on building leases. Fourteen houses have been demolished, and the remaining seventy-three houses will no doubt be demolished at an early date. The buildings contained 278 rooms, which were occupied by about 437 persons of the working class, of whom ninety-one have already been displaced.

Thirty-three houses in Smith-street, Durham-terrace, and Queen's-road West have been demolished, and eleven houses in Christchurch-street are about to be demolished. The forty-four houses contained about 218 rooms, of which thirty-six are still occupied. About 275 persons of the working class have already been displaced, and it is estimated that the whole clearance involves the displacement of 327 persons.

These clearances, therefore, in one metropolitan borough involve the demolition of about 331 houses and the displacement of about 1,788 persons of the working class."

Vauxhall Bridge—Proposed Models of Propylæa.—The Improvements Committee reported as follows:

"The Council on May 19, 1903, upon the recommendation of the late Bridges Committee, approved the design, then submitted, of the new Vauxhill Bridge and the proposed architectural and artistic treatment of the same, but reserved for future consideration the question of erecting propylæa on the abutment piers. An April 10, 1906, we advised the Council to sanction the erection, at an estimated cost of 15,400*l.*, of granite propylæa at both approaches to the bridge, but on May 1, 1906, our Chairman accepted an amendment to refer the matter back for further consideration and report. We have given further consideration to the matter, and we think that, in order to afford members of the Council and of the general public an accurate idea of the architectural effect which will be produced by the erection of propylæa, full-sized models should be built at one approach to the bridge in the exact positions which the propylæa, if sanctioned, would occupy. In order to withstand the high wind pressure which may be expected, and to provide a structure which might last for several months, each model should consist of a strong wooden staging securely anchored to the top of the existing granite piers. This staging would be faced with slabs of light fibrous plaster screwed to wood studding. The work would be of a special character, and we have therefore consulted a firm, which has great experience in work of this description, as to the probable cost. As a result, we estimate the total cost of two models at 440*l.* The provision of rough plaster figures would cost about 50*l.*, but we think that these figures on the models may be dispensed with. In our opinion, the work is not one which should be executed without the intervention of a contractor.

We have caused small models of the propylæa, and copies of a statement describing the same, to be placed in the lobby of the Council chamber. One of the models (No. 1) is square and of plain design; the other (No. 2) has rounded ends and some decorative treatment of the sides. The total estimated cost of erecting, in granite, propylæa for both approaches to the bridge, in accordance with design No. 1, would be 12,600*l.*, while if design No. 2 be adopted, the cost would be 15,120*l.* We think that design No. 1 would be in greater harmony with the general features of the bridge than No. 2, and we propose that the models should be constructed on this design. The unexpended balance of the several votes passed by the Council for the construction of the bridge is amply sufficient to cover the cost of the works proposed, and we recommend:—(*a*) That expenditure on capital account not exceeding 440*l.* be sanctioned for the erection at the west approach to Vauxhall Bridge of two full-sized models of the suggested propylæa. (*b*) That two full-sized models of the suggested propylæa be erected at the west approach to Vauxhall Bridge, in accordance with design No. 1 submitted to the Improvements Committee on March 28, 1906; and that the Committee be authorised to arrange for the erection of the work."

The following is the statement referred to:

"This model, to a scale of ½ in. to a foot has been prepared to show in effect the decorative treatment of the finished structure, and the principles which guided the composition as a whole. It will be observed that the constructive steelwork has been accepted in its mercantile form, and treated in the most legitimate manner, such artistic value as obtains being dependent solely on the fine sweep of the balustrade from end to end, and the bold curved projection to the footways. The decoration, which is in the hands of sculptors of distinction, and is thus of the best quality obtainable, is employed sparingly, and only to such parts as are of considerable importance in the design. The approaches, for example, are marked with granite propylæa, rising to a height of 56 ft. from the pavement, crowned by symbolic decorative figures, while the points of support, over the cutwaters, are treated with bronze figures representing Science, Fine Arts, Local Government, Engineering, Architecture, Agriculture, Education, and Pottery. The foregoing treatment of the work is, it is submitted, justified on both economical and artistic grounds, for it will be seen that when the whole of the decoration is paid for, including the sum required for the proposed propylæa at both approaches, a balance of about 25,000*l.* on the sum voted for the original structure will remain. The result, it is thought, is such as will assure a dignified and satisfactory effect, worthy of the important work it is intended to complete."

No. 17, Fleet-street.—The Local Government Records and Museums Committee reported as follows:

"We have had under consideration the arrangements for admitting the public to the "council chamber" on the first floor of No. 17, Fleet-street, which, as the Council is aware, has been specially reserved. The stained-glass windows kindly presented by Mr. Sturge, have now been fixed, and the room has been furnished mainly with surplus furniture not suitable for general office use and placed at our disposal by the Establishment Committee. We propose that the hours during which the public will be admitted to the room shall be from 10 a.m. to 2 p.m. on each day except Sundays, Good Friday, and Christmas Day. These hours have been selected owing to the fact that, while the right of the public to access to the room will be secured, the Council will also be in a position to let the room for hire to learned societies and the like for the purposes of meetings. The fact that the room is available for such purposes has been advertised, and two applications have already been acceded to upon agreed fees pending the fixing of a scale of charges. It has also been suggested that the room, owing to the position it occupies, would be useful as a depôt for the sale of the more important of the Council's publications. The caretaker would have charge of these arrangements, and all that would be necessary to be provided would be a specimen case and storage accommodation. We concur in the suggestion, and we submit a recommendation accordingly. There will be published and placed on sale in the room a handbook with regard to the building, in which its historical associations, and also the action taken by the Council in preserving it, will be stated. The handbook will be circulated to members of the Council. We had hoped that it would have been practicable to accommodate a portion of the Council's staff in the room without hindrance to its use by the public, but we have reluctantly had to abandon the proposal. We are not yet in a position to make a recommendation as to the permanent custody of the room, but in order that it may be opened at the earliest possible date, we propose that a woman should be temporarily employed as caretaker, and to do the necessary cleaning. Provision for the expenditure is made in the maintenance estimates (vote 59) for the current financial year. We recommend:—

(*a*) That the "council chamber" at No. 17, Fleet-street, E.C., be opened to the public on week-days (except Good Friday and Christmas Day) between the hours of 10 a.m. and 2 p.m.

(*b*) That during the time the room is not open to the public it be available for hire for the purposes of meetings; and that the Local Government Records and Museums Committee be authorised to act on behalf of the Council in the matter.

(*c*) That arrangements be made for the sale in the room of the handbook relating to No. 17, Fleet-street, and of the most important of the Council's publications.

(*d*) That, pending the settlement of permanent arrangements for the custody of the room during the time it is open to the public, the employment temporarily of a female caretaker at the wages of 5*d.* an hour be authorised."

London County Buildings Bill, 1906.—The Parliamentary Committee reported as follows:

"The London County Buildings Bill came before a Select Committee of the House of Lords, presided over by the Earl of Camperdown, on June 26 and 27, and July 2, 1906. The Hon. J. D. Fitzgerald, K.C., and Mr. Vesey Knox appeared as counsel in support of the Bill, and Mr. J. W. Cleland, M.P., the Chairman of the Establishment Committee, was the chief witness on behalf of the Council. The Council's Architect, the Chief Engineer, and the Valuer gave evidence on technical matters, and Mr. Norman Shaw, R.A., and Professor A. Beresford Pite gave evidence, as to the necessity for acquiring the whole of the lands scheduled in the Bill for the erection of the proposed buildings. The only petitioners against the Bill were Messrs. Holloway Bros., who objected to the acquisition of their premises, contending, as they did before the House of Commons Committee, that the Council had sufficient space without interfering with their property; that their premises were indispensable for the conduct of their business; that it would be impossible to find other suitable premises on the river side, and that no compensation which might be given to them would be adequate for the injury which they alleged would be caused by their being disturbed. On June 27 the hearing of evidence was concluded, and the Committee decided that the Bill should proceed, and adjourned the consideration of the clauses of the Bill until a later date. On the consideration of the clauses on July 2, the committee, on the opposition of Messrs. Holloway, decided to strike out clause 11, which provided that if the arbitrator was of opinion that a claimant had failed to give to the Council sufficient particulars of his claim for compensation, and in sufficient time to enable the Council to make a proper offer, such claimant should pay one-half of the costs of the arbitration. Counsel for Messrs. Holloway submitted a clause for the reinstatement of the company on a site in the Belvedere-road, with a river frontage, equivalent in all respects to the site now occupied by them. This was strongly opposed on behalf of the Council, and the Committee declined to insert the clause, but accepted a proposal made by counsel on behalf of the Council, that Messrs. Holloway should not without their consent be disturbed in the possession of their premises until three years after the date of service of notice to treat, and that they should have free access to their premises by road and by river so long as they were in occupation. A clause embodying the proposal was accordingly inserted in the Bill. An undertaking that the notice to treat should be served within twelve months from the passing of the Act, was given on behalf of the Council. The Bill, as amended, has been reported to the House, and awaits third reading."

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Clapham.—An addition to a one-story shop on the forecourt of No. 650, Wandsworth-road, Clapham, abutting upon Queen's-road (Mr. W. C. Poole for Mr. M. Jones).—Consent.

Clapham.—A porch in front of No. 9, Bolingbroke-grove, Clapham (Mr. F. G. James for Mrs. Stuckey).—Consent.

Dulwich.—A deviation from the plans approved for the erection of buildings on the west side of Vestry-road, Camberwell, so far as relates to (*a*) an alteration in the position and form of the bay windows; (*b*) a rearrangement of the planning of the rear portions of the buildings; and (*c*) the erection of three pent roofs in front of such buildings (Messrs. E. Crosse & Co. for Mr. G. Pedley).—Consent.

Holborn.—A building to be used as an out-patients' department at the Hospital for Sick Children, Great Ormond-street, Holborn (Mr. C. E. Barry for the Chairman and Board of Governors of the hospital).—Consent.

Islington, North.—A one-story building on the eastern side of Hornsey-road, Islington, to abut upon Lambton-road (Mr. C. H. W. McCullagh).—Consent.

Lewisham.—A one-story shop in front of No. 3, Brownhill-road, Catford (Messrs. Norfolk & Prior for Mr. J. Allder).—Consent.

Paddington, South.—A deviation from the plans approved for the erection of one-story shops in front of Nos. 110 and 112, Westbourne-grove, Paddington, so far as relates to the erection of a pilaster on, and the projection of the facia and cornice over, the land to be dedicated and left open for the use of the public (Mr. J. A. L. Gimbletté).—Consent.

Wandsworth.—Porches to thirty-seven proposed houses in Landford-road, Putney (Mr. H. Bignold for Mr. G. A. Gale).—Consent.

Wandsworth.—That the application of Mr. H. G. Hills, for the Wandsworth Metropolitan Borough Council, for an extension of the periods within which the erection of buildings on the northern side of Mitcham-road, Tooting, to abut upon Ensham-street, was required to be commenced and completed, be granted.—Consent.

Wandsworth.—A one-story building on the southern side of Wilna-road, Garratt-lane, Wandsworth, westward of Farlton-road (Mr. D. H. Smith for Mr. P. Bleines).—Consent.

Wandsworth.—The retention and erection of porches to forty-four houses on the south-eastern side of Back-lane, Tooting, between Welham-road and Southcroft-road (Mr. E. L. Schneider for Mr. R. H. Miller).—Consent.

Lewisham.—The retention and completion of a dwelling-house adjoining No. 106, Bargery-road and of a dwelling-house adjoining No. 113, Inchmery-road, Catford, with the flanks of such houses abutting upon Thornsbeach-road (Messrs. Norfolk & Prior for Mr. J. Watt).—Refused.

Peckham.—An open-air pulpit with entrance-steps thereto, in front of a mission church and hall on the site of Nos. 109, 111, and 113, Albert-road, Peckham (Mr. G. A. Lansdown for the vicar and churchwardens of St. Mary's Church).—Refused.

Strand.—A crane over the public way at the front of No. 71, Dean-street, Oxford-street (Mr. E. K. Purchase).—Refused.

Strand.—An addition to the existing porch in front of No. 10, Carlton House-terrace (Messrs. D. Blow & F. Billerey for the Right Hon. the Viscount Ridley).—Refused.

Westminster.—An addition over the one-story shop in front of No. 127, Victoria-street, Westminster (Messrs. Zeph King & Son for Messrs. White, Chatton, & Co., Ltd.).—Refused.

Width of Way.

Kensington, South.—Two studio buildings on the southern side of Logan-place, Kensington, at less than the prescribed distance from the centre of Logan-mews (Mr. G. H. Jenkins for Professor G. Moira and Mr. F. L. Jenkins).—Consent.

St. Pancras, South.—A factory and warehouse building on the northern side of Leeke-street, King's-cross-road, St. Pancras, eastward of the Metropolitan Railway cutting, at less than the prescribed distance from the centre of the roadway of Leeke-street (Mr. M. Garbutt for the Metropolitan Railway Surplus Lands Committee).—Consent.

Whitechapel.—A deviation from the plan approved for the re-erection of Nos. 21, 22 and 23, Great Pearl-street, Spitalfields, so far as relates to the re-erection of water-closet buildings, not exceeding 9 ft. in height, in the yards at the rear of the said premises (Mr. W. Gilbert for Mr. A. Wearing).—Consent.

Width of Way and Lines of Frontage.

Kensington, North.†—The retention of a building at the rear of No. 124, Holland Park-avenue, Kensington, abutting upon Princes-road, at less than the prescribed distance from the centre of the roadway of Princes-road (Mr. S. J. B. Stanton, for the Holland Park Motor Company).—Consent.

St. George, Hanover-square.—An alteration to a projecting bay-window at the rear of No. 37A, Park-lane, abutting upon Norfolk-street (Messrs. W. H. Romaine-Walker & Besant for Mr. H. J. Duveen.)—Consent.

Stepney.—Four one-story shops in front of Nos. 31, 33, 35, and 37, Redmans-road, Mile End, at less than the prescribed distance from the centre of the roadway of the street (Mr. W. E. H. Crawley).—Refused.

Westminster.†—The retention of an office building at No. 45, Horseferry-road, Westminster (Mr. R. G. Hammond for Mr. J. Garlick).—Refused.

Width of Way, Lines of Frontage and Space at Rear.

Holborn.—A deviation from the plans approved for the erection of a building, known as the Cranston Ivanhoe Hotel, on a site abutting upon Great Russell-street, Bloomsbury-street, Streatham-street and Dyott-street, Holborn, so far as relates to the erection of an addition, to consist of cloak-rooms and a water-closet in the area at the rear of such building (Mr. T. D. Rhind for Cranston's Hotel Company).—Consent.

Width of Way and Space at Rear.

Marylebone, West.—Working-class dwellings upon the site of Nos. 26 to 30, Lisson-street, and Nos. 28 to 30, Mitcham-street, St. Marylebone (Mr. W. Lockwood for Lieut.-Col. Sandys, M.P.).—Refused.

Lines of Frontage and Space at Rear.

Battersea.—An addition at the rear of Nos. 417 and 419, Battersea-park-road, Battersea, to abut upon Carlton-grove (Mr. H. E. Rossiter for Mr. F. Muhlenkamp).—Consent.

Space at Rear.

Lewisham.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of a house on the northern side of Lanier-road, Lewisham (Mr. A. H. Wentworth for Mr. J. Phillimore.)—Consent.

Space at Rear and Alteration of Buildings.

Marylebone, West.—Bath-rooms and water closets at No. 4, Duke-street, St. Marylebone (Messrs. Freeman & Ogilvie for the Hon. Louisa Kinnaird).—Consent.

Formation of Streets.

Marylebone, East.—A deviation from the plan approved for the formation or laying out of a new street for carriage traffic, to lead from High-street, Regent's-park, into Lower William-street, so far as relates to an alteration from 6 ft. to 5 ft. 8 in. in the width of a strip of land to be dedicated to and left open for the use of the public in Barrow-hill-road (Mr. F. J. Stevenson).—Consent.

Greenwich.—That an order be issued to Mr. A. Roberts, refusing to sanction the formation or laying out of new streets for carriage traffic leading out of the north side of Woolwich-road, Greenwich, westward of Lombard-road (for Mr. E. T. Fysh).—Refused.

Lewisham.—That an order be issued to Mr. R. Stewart, refusing to sanction the formation or laying out of new streets for carriage traffic upon the St. German's estate, Catford, leading out of the south side of Dowanhill-road (for Mr. A. Cameron Corbett).—Refused.

Uniting of Buildings.

Kensington, South.—A deviation from the plans approved for the retention of openings uniting Nos. 4 and 6 to No. 8, Lexham-gardens, Earl's-court, so far as relates to a slight alteration in the planning of the premises and an extension of the conservatories on the first floor at the rear. (Mr. E. L. Wratten).—Consent.

Cubical Extent.

Marylebone, East.—An addition to a motor repository at No. 1, Albany-street, St. Marylebone (Messrs. Brown & Barrow for Messrs. Friswell, Ltd.).—Consent.

The recommendations marked † are contrary to the views of the local authorities.

Competitions.

BATHS, FIRE STATION, AND LIBRARY, REDDISH.—The assessor, Mr. Bramwell Thomas, has awarded the premiums in connexion with the Reddish Baths, Fire Station, and Library competition as follows:—(1) Messrs. A. E. Dixon and Mr. C. H. Potter, 65, King's-street, Manchester; (2) Mr. J. Myrtle Smith, 8, Trafalgar-square, Chelsea; and (3) Messrs. Shewbrooks & Hodges, 24, Grainger-street West, Newcastle-on-Tyne.

WESLEYAN CHURCH, OSSETT.—In a limited competition for new Wesleyan Church and classrooms at South-parade, Ossett, the plans and designs by Messrs. Garside & Pennington, architects, of Pontefract and Castleford, have been selected. The church is to seat 400, to be fitted with the best pitch pine, and built of stone, with red tile roof, and the windows glazed with leaded lights. The style is perpendicular Gothic.

HOLBORN COUNCIL'S NEW OFFICES.—At the meeting on Wednesday evening of Holborn Borough Council, the Establishment Committee reported having considered the plans sent in for the proposed new Council offices by the six architects appointed to submit competitive designs. In deciding upon the respective merits of the plans, the committee had carefully gone into the convenience of the proposed arrangements, and the access of light and air to the different parts of the building. They were of opinion that set No. 1 best met the Council's requirements, and as it incorporated a larger portion of the existing building than any other set of plans, it appeared to them to be the most economical. While not less pleasing than any of the other designs, it was better adapted for the particular site. The committee considered design No. 5 second in order of merit, and design No. 6 third. With regard to the expenditure, all the six architects estimated the cost of carrying out their plans at about £20,000. The actual price estimated by the architect of No. 1 set was £19,205. Alderman Donaldson Rawlins, K.C., moved (1) that the architect of No. 1 set be appointed architect, (2) that the other competitors be thanked for the care and skill shown in their designs, (3) that the Establishment Committee be instructed to communicate with the selected architect, with the view of his preparing working plans, and to take all other necessary steps for proceeding with the erection of the new offices. The Mayor then announced that the authors of the selected design were Mr. Septimus Warwick and Mr. Herbert Hall, South-square, Gray's Inn, W.C.

BOOK RECEIVED.

HADDON: THE MANOR, THE HALL, ITS LORDS, AND TRADITIONS. By G. Le Blanc Smith. (Elliot Stock.)

Correspondence.

DURHAM COUNTY SCHOOLS, SOUTHMOOR.

SIR,—The notice in your issue of the 6th inst. is contrary to fact, Mr. W. Rushworth, F.R.I.B.A., did not act as the assessor in the selection of the designs, but drew up a report for the Education Committee, in which one of the designs of Messrs. Clark & Moscrop was placed fourth in order of merit, whilst the other was not mentioned at all; that of Messrs. Liddle & Brown was placed fifth. The sub-committee, consisting of four members, ignored Mr. Rushworth's report, and selected the designs they themselves preferred.

A COMPETITOR.

*** We published the information as furnished to us; we had no means of testing its accuracy. —ED.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday last week at the offices, Victoria-embankment, E.C.

Half-yearly Estimates.—The Finance Committee submitted a statement showing that the estimates of expenditure on that of current account for the half year ending Lady Day, 1907, were 531,145*l.*

Leavesden Asylum.—The Works Committee reported having authorised the expenditure of 173*l.* 5*s.* on the provision of a vertical boiler in connexion with the sewage irrigation works at this Asylum.

The Asylums Committee submitted a report dealing with the heating arrangements at the Asylum. The matter had occupied the attention of the Committee for some time, and reports from the Works Committee and the Engineer-in-Chief had been considered. As a result of their consideration of the subject, the Committee recommended that the existing grates should be replaced by modern slow combustion grates, the work to be carried out by the Asylum staff. This was agreed to by the Board. It is estimated that the work will cost 308*l.*

Joyce Green Hospital.—Plans prepared by Messrs. Treadwell & Martin for the provision of a goods reception station, with a porter's lodge, and sixteen cottages, on the Joyce Green Hospital Estate, were approved and forwarded to the Local Government Board.

The Student's Column.

ROOFS: STRUCTURALLY CONSIDERED.—I.

A ROOF is very generally defined as the external upper covering of a building, intended to protect the inmates and contents against inconvenience and injury by the weather. The definition is not entirely satisfactory, for the roof is always an essential portion of a building, whether it assists or does not assist to tie the walls together. Moreover, the roof frequently constitutes a characteristic feature of architectural design as applied to the exterior or interior of a building. In some cases, again, it is impossible to draw a line of demarcation between the roof and the sides of a building, as, for instance, in types of domed or arched construction where the springings are at or not far above ground level.

Bearing these points in mind, we see that it is not easy to formulate a short and simple definition covering every form of roof construction, and for the purpose of the present series of articles we need not make the attempt.

1. *General Classification of Roofs.*

Judged from the standpoint of structural design, roofs are divisible into two main classes :—

(1) Roofs exerting pressure upon the supports in a purely vertical direction.

(2) Roofs exerting pressure upon the supports in an outward direction at an angle with the vertical.

It should be pointed out, however, that horizontal thrust may be exerted against the supports of any roof coming within Class 1, in consequence of lateral wind pressure and of expansion due to temperature rises.

The two classes cover every conceivable type of roof construction, but while the classification is useful for the purpose of permitting us to differentiate between the two essential principles of design, it affords no clue to the form of a roof or even of its principal members, nor does it suggest the manner in which a roof is applied to or incorporated with the other portions of a building.

These are points to which attention will be devoted in due course, but before doing so we propose to consider briefly the two main portions of which all roofs are composed.

2. *Roof Framework and Covering.*

Every type of roof comprises two portions :—

(1) The framework.
(2) The covering.

The chief members of the most elementary flat roof are horizontal rectangular beams—of timber, steel, or other material—with parallel sides, resting at each end upon the walls of a building, and fixed so as to constitute a simple form of framework.

The covering for the same roof consists of timber boards, metal sheets, or a layer of any suitable material, attached to or incorporated with the upper surface of the beams, and serving two purposes :—(1) To exclude rain, snow, wind, heat, and cold from the interior of the building; and (2) to connect the beams together. Hence the covering of such a roof virtually completes the framework. Assuming the covering to consist of boards, it would be necessary to overlay them with some waterproof material to prevent the penetration of rain to the interior of the building, and the roof must also be made with a fall sufficient to permit water to flow away from the upper surface.

The roof here considered is a most rudimentary type of construction, illustrating the primary components of a flat roof designed in accordance with the principle embodied in Class 1.

An equally simple type of roof is that where the main members of the framework consist of inclined rectangular beams with parallel sides supported on walls of unequal height, and the covering is of the kind indicated above. In this case the beams are termed *rafters*, and, as before, the covering practically completes the framework.

This type of structure, generally designated a *lean-to*, *pent*, or *shed* roof, comes under Class 2, because outward pressure is exerted against the supports by the ends of the rafters.

The inclination or slope of the roof, technically described as the *pitch*, facilitates the rapid flow of rainwater from the upper surface. Therefore, the design is distinctly preferable to that of a flat roof, although circumstances frequently arise in which the latter is desirable or necessary.

3. *Roof Framework.*

Even in the most elementary types of flat and lean-to roofs the ends of the beams, or rafters, as the case may be, are often connected by horizontal members laid upon or built into each wall with the object of distributing the weight of the roof over the brickwork. These horizontal members are termed *wall-plates*, and help to consolidate the system of beams or rafters into a self-contained frame, more or less independent of the lateral bracing afforded by the roof covering.

When the length of the span and the spacing of the main beams in a flat roof are increased beyond certain limits, lateral support must be given to the beams by the introduction of *secondary beams*, in accordance with the practice followed in floor construction. Under similar circumstances the rafters of a lean-to roof would be braced by the addition of horizontal members analogous to secondary beams, but technically described as *purlins*.

If the span of a lean-to roof exceeds about 8 ft. or 10 ft., it is usual to place beneath the rafters a series of strong sloping beams or frames termed *principals*, and spaced at wider intervals than those between the rafters. The principals are connected by *purlins*, upon which the rafters are supported, and the roof covering is laid and secured to the rafters in an appropriate manner. In roofs of still longer span between walls of equal height, the principals consist of simple or complex framed structures of rectangular, polygonal, or segmental outline, which are generally described as *roof trusses*.

Such trusses or principals are self-contained and belong to Class 1, because, under normal conditions, they exert only vertical pressure upon the walls or other supports. Other principals are designed as arch ribs exerting outward thrust against the supports, and so come under Class 2. Roof principals are connected laterally by purlins on which the rafters and roof covering are supported, substantially in the manner previously mentioned.

Although the framework and the covering of a large roof are necessarily somewhat complicated, the general idea of the design is not essentially different from that embodied in a small roof wherein principals, purlins, and rafters are employed.

Hence we have three forms of framework for practically all roofs.

(1) Consisting of simple beams or rafters connected at the supports by walls or wall-plates, and between the supports by the roof covering.

(2) Consisting of beams or of rafters connected at the supports by walls or wall-plates, and between the supports by secondary beams, or by purlins, as the case may be.

(3) Consisting of properly-framed principals connected by purlins carrying the rafters.

In practice, purlins are not applied between the rafters of small and simple roof frames built without principals, because the rafters themselves are usually spaced at such short intervals apart that intermediate lateral support is not necessary. The framework of a roof covered by glass also includes the sash-bars between the rafters, as well as wind-ties and other details that need not be specified at the present stage.

4. *Roof Covering.*

The nature of the material employed as the outer covering affects the details of roof construction in some measure.

For instance, in a roof built with principals and purlins, when either felt, zinc, lead, or copper is laid over boarding, intermediate rafters may sometimes be omitted, as the boards can be attached directly to the purlins.

When this course is followed, the spacing of the purlins must be less, or the thickness of the boards greater than in a roof where rafters are retained. Again, for fixing tiles or slates, longitudinal battens are attached to the rafters at intervals corresponding with the dimensions of the tiles or slates. In this case the battens constitute bracing, which adds considerably to the stiffness of the upper framework. As slates are very often laid upon battens nailed over boarding and felt, intermediate rafters can be omitted in roofs with principals of small span, providing due compensation be made by increasing the number of purlins and the thickness of the boards. The pitch of a roof may be affected by the character of the covering material, if the use of any particular substance is obligatory.

When corrugated iron roofing is adopted, the framework can be reduced in weight or even omitted, as shown in Par. (6).

5. *Roofing Felt.*

Asphalted felt made of animal or vegetable fibre is an inexpensive and useful material for roofing purposes. It is largely applied as an outer protection to the boarded covering of sheds and temporary buildings, and, being a good non-conductor of heat, is also used to form an insulating layer beneath slates, galvanised iron, and other materials in permanent as well as in temporary roofs. Roofing felt is supplied in rolls containing from 25 yds. to 35 yds., 32 in. wide, the thickness of the material being about 3-16 in. The sheets should be laid with an overlap of 2 in. at the joints, and secured to the boarding beneath by nails, dipped hot in grease or oil, at intervals of about 2 in. When exposed to the weather, the enduring quality of a felt covering is much increased by the application of a mixture of tar and slaked lime, well boiled and laid on hot, the outer surface being sprinkled with fine sand.

6. *Corrugated Iron.*

Galvanised corrugated iron sheeting is another form of roof covering for buildings of more or less temporary character. This material necessitates a specially-designed roof framework to permit the full strength of the sheets to be utilised. If disposed so that the corrugations are parallel with the slope of the roof, the sheets are laid directly on the purlins, which can be spaced from 6 ft. to 12 ft. apart according to the gauge of the sheets and the depth of the corrugations. By employing curved sheets of corrugated iron, roofs can be formed without supporting framework of any kind, the eaves being stiffened by an angle bar or gutter, and connected by tie-bars to take the horizontal arch thrust. Roofs built in this way are only to be recommended for temporary purposes, though if provided with a light framework they are quite suitable (structurally) for some types of permanent work. If the sheets are disposed with the corrugations parallel to the eaves of a building, sufficient support is afforded by rafters, spaced from 6 ft. to 12 ft. apart according to the stiffness of the sheets, and no purlins are necessary. The disadvantage of such an arrangement is that rainwater cannot flow away unless a special type of corrugation be adopted.

In comparatively pure air, galvanised sheets last for many years, but in large cities and manufacturing districts their life is short unless protected by paint. Owing to minute defects in the zinc coating, and to cracks caused during the subsequent process of corrugation, galvanised sheets are often inferior to well-painted sheets in respect of resistance to corrosive influences. For this reason many engineers prefer to use plain corrugated sheets in situations where the atmosphere contains a high proportion of sulphurous and other acid gases.

Corrugated iron sheets in stock sizes vary from 5 ft. to 10 ft. long, and from 2 ft. to 2 ft. 9 in. wide, the corrugations ranging from 3 in. to 5 in. apart, centre to centre. Sheets for roofing purposes are used in various thicknesses from No. 16 to No. 22 Standard Wire Gauge. No. 16 gauge is only adopted for roofs of exceptional strength, No. 18 gauge is generally considered sufficient for high-class work, No. 20 gauge is employed for ordinary permanent roofs, and No. 22 gauge for the roofs of temporary buildings.

When laid, the sheets should overlap about 2½ in. along the corrugations, and from 3 in. to 6 in. along the edges crossing the corrugations, the overlap being inversely proportional to the pitch of the roof. The sheets should be connected by single riveting along the edges, and double riveting at the ends. The pitch of the rivets may be 9 in. centre to centre. Galvanised bolts are frequently employed in place of rivets, but are not so satisfactory for permanent work. Bolted joints should always be made along the ridge of the corrugations to minimise the percolation of water through the holes. Bolt and rivet holes can be punched by hand during erection of the roof. By first trying the sheets in place the precise position of the holes can be determined and marked. The adoption of this course enables the fitter to avoid blind holes, which always offer a loop-hole for the penetration of water between the sheets.

Where the roof framing is of steel, corrugated sheets are generally fixed in place by means of galvanised hooked bolts passing under the purlins and held by nuts on the outer surface of the sheets.

In the case of timber framework, the sheets are attached by means of galvanised screws or spikes.

Galvanised iron roof ridges, louvre blades, gutters, and other fittings are readily obtainable for the completion of the roof covering. Makers of corrugated iron supply galvanised rivets, bolts, screws, spikes, together with curved washers of suitable shapes.

The following rule will be found useful for calculating the transverse strength of corrugated iron sheets :—

$$W = \frac{100{,}000\ t\ b\ d}{l} \quad \ldots\ldots (1)$$

where
W = breaking weight (uniformly distributed) in pounds.
t = thickness of sheet in inches.
b = breadth of sheet in inches.
d = depth of corrugation in inches.
l = length of sheet between supports in inches.

Example (1).—Find the breaking weight for a galvanised corrugated iron sheet, of No. 18 standard wire gauge, 2 ft. wide, with an unsupported span of 6 ft., the depth of corrugation being 1 in.

Here
t = 0·048 in. (see Table I.).
b = 24 in.
d = 1 in.
l = 72 in.

Substituting these values in formula (1) we have

$$W = \frac{100{,}000 \times 0{\cdot}048 \times 24 \times 1}{72}$$

$$= \frac{115{,}200}{72} = 1{,}600 \text{ lb.}$$

As the area of the sheet is $(6 \times 2) = 12$ sq. ft., the breaking weight per square foot is $1{,}600 \div 12 = 133$ lb.

TABLE I.—GALVANISED CORRUGATED IRON SHEETS.

Depth of corrugation is usually one-fourth the width

S.W.G.	Equivalent in Inches.	Corrugations.	
No.		No.	Width.
16	0·064	5 and 6	5
18	0·048	5 and 6	5
18	0·048	6 and 7	4
20	0·036	6 and 7	4
18	0·048	8 and 10	3
20	0·036	8 and 10	3
22	0·028	8 and 10	3
24	0·022	8, 9 and 10	3
26	0·018	8, 9 and 10	3
28	0·0148	8, 9 and 10	3

Obituary.

MR. BRADLEY BATSFORD.—We regret to hear, at the moment of going to press, of the sudden death of Mr. Bradley Batsford, the senior partner of the firm of architectural booksellers and publishers, of 94, High Holborn. Mr. Batsford's death follows somewhat soon after that of his father, the founder of the firm, so that it is only necessary to say he was responsible for the inception and in great measure for the development of the publishing side of the business, which has always owed much to his ability and judgment, and many other sterling qualities, of which the authors and all others who came in contact with him will be aware. He was a man of taste and artistic perception, and took a great personal interest and pleasure in his publications. Mr. Bradley Batsford was born in 1846, and entered his father's business at the age of thirteen, and remained in it until his death. He leaves a widow and two daughters.

MR. GANT.—Mr. William John Gant, of No. 11, Havelock-road, Hastings, died at his residence, The Glen, London-road, St. Leonards-on-Sea, on Monday in last week, aged eighty-two years. He was elected an Associate in 1881, and in 1892 a Fellow of the Royal Institute of British Architects.

General Building News.

WESLEYAN CHAPEL, HUDDERSFIELD. — The opening recently took place of a new chapel which has been erected for the Wesleyan community at Crosland Moor, Huddersfield. There is a nave, two transepts, and a turret rising to over 70 ft. Accommodation is provided for a congregation of 610. The interior woodwork is of pitch-pine. Messrs. J. W. Morley & Son (Bradford) were the architects.

SUNDAY-SCHOOLS, IPSWICH.—New Sunday-schools have been opened in connexion with the Bethesda Baptist Chapel, in Fonnereau-road, Ipswich. The structure is Gothic in style, constructed with red-brick facings, with ornamental red-brick dressings. It will accommodate about 400 children, and is so arranged that it can be divided by curtains into separate classrooms, while at the east end is a platform. The floor is of wood, laid on concrete, and ventilation is secured by means of ventilating tube inlets and roof ventilators. Warmth is provided by means of hot-water (low-pressure) pipes. Seating accommodation is provided by means of rows of stained and varnished forms, with reversible backs. There are lavatories and a kitchen attached. The new buildings were designed by Mr. Frederick G. Faunch, the contractor being Mr. G. A. Kenney.

PARSONAGE HOUSE, GRENOSIDE.—A new Parsonage House is to be erected at Grenoside by the Stacye Memorial Committee. Seven architects submitted designs for the house, and Messrs. R. & W. Dixon, of Barnsley, were the successful competitors. The tender of 997*l.*, of Mr. C. W. Squire, of Barnsley, has been accepted. This figure, however, does not include the value of the ground, boundary walls, or roads. Up to the chamber floor the house will be built of Grenoside stone, and above the wall will be tiled. Stone alone is to be used for the tower.

NEW GASWORKS, TAVISTOCK.—The new gasworks have just been completed, after designs by Mr. J. W. Buckley, Engineer to the Devonport Corporation Gasworks, the plant being by Messrs. Willey & Co., of Exeter. The works will produce about fifty millions cubic feet of gas per annum ; the two gas-holders, in steel tanks at ground level, 20 ft. deep and 50 ft. in diameter, will contain 90,000 cubic ft., and 60,000 ft. more when enlarged to their greatest extent. Three settings, after the regenerator type, of six 21 in. by 15 in. D-shaped retorts in the retort-house will yield an output of 7,300 cubic ft., per mouthpiece every twenty-four hours, at a consumption of 14 lb. of fuel for each hundredweight of coal carbonised.

HOTEL BUILDINGS, KINGUSSIE.—Tenders have been accepted for the erection of additional buildings in connexion with the new hotel which is in course of construction on the same site as and conjointly with the old hostelry—the Duke of Gordon Hotel. These will consist of stabling accommodation for about twenty horses, a building to accommodate at least a score of motor-cars, washing-house and laundry, and a stone and lime boundary wall. Mr. Alexander Cattanach, The Laurels, Kingussie, the designer of the new hotel, is the architect, and the successful contractors are as follows :—Masons, Messrs. Ferguson & Co., Newtonmore ; carpenters, Messrs. Hay & Sime, Perth ; plasterers, Messrs. R. & L. Macpherson, Kingussie ; painters, Messrs. Dunbar & Macpherson, Kingussie.

HALL EXTENSIONS, SUNDERLAND.—The foundation-stone of an extension hall in connexion with the Thompson Memorial Hall was recently laid. The extension has been designed by Mr. G. T. Brown, and the contractors are Messrs. R. Stafford & Sons.

Stained Glass & Decoration.

EGLOSKERRY CHURCH, NORTH CORNWALL.—A large four-light memorial east window has just been executed and erected in Egloskerry Church. In the four lights are depicted the four archangels—Gabriel, Raphael, Uriel, and Michael—and in the tracery openings are angels with musical instruments. The whole work was designed and executed by Messrs. Percy Bacon & Brothers.

Miscellaneous.

A CONFERENCE ON HOUSING.—The Christian Social Union will hold a conference upon housing on July 14, at Letchworth Garden City. Lady Gwendolen Cecil and Miss Sybilla Gurney will read papers upon "Rural Housing" and "Co-partnership in Housing," and Mr. Henry Vivian, M.P., will open the discussion. Mr. F. Litchfield, of No. 22, Red Lion-square, W.C., is secretary of the conference.

THE MALL.—In the House of Commons on the 4th inst., Mr. T. Davies (Fulham) asked the First Commissioner of Works whether he could inform the House when he expected the work of extending the Mall would be completed ; and whether it was his intention to demolish any more of the buildings in Spring-gardens in order to have a wider and a more imposing entrance from Charing Cross. Mr. Harcourt (Lancs, N.E., Rossendale) —The new Admiralty building at the end of the Mall is expected to be completed by the end of 1908. The buildings in Spring-gardens referred to are not the property of his Majesty's Government, and I am not aware of any proposal to demolish them ; but if this is suggested it would seem to be in the nature of a metropolitan improvement, and as such is a matter for the London County Council.

HOUSING OF WORKING CLASSES.—The Select Committee of the House of Commons on the Housing of the Working Classes Amendment Bill met again on the 4th inst., Sir J. Dickson-Poynder presiding, and took the evidence of Mr. Wilson Fox, of the Board of Trade. He gathered from inquiries that there was still a considerable deficiency of labourers' cottages, in spite of a marked improvement in the last ten or twelve years. In reference to the talk of cottage building as if it were charity to labourers, he pointed out that, although a cottage might not pay interest on the building expense, it might indirectly bear good interest as part of the equipment of a farm. In the purely rural districts a rental much over 1s. 6d. a week was a high rent. The cash wage of the labourer ranged from 12s. to 20s. a week, if averaged over a large number of counties, and he did not know how some of them lived. It would be better for the farmers, as well as for the men themselves, that they should have an adequate quantity of land attached to their houses, as more labour would be available when wanted only at odd times. Experiments in co-operative utilisation of small holding produce would be worth trying under official guidance. The organisation in the country must precede that in the town. The building by-laws had been the result of neglect of proper sanitary precautions in the past. If the local authority did their duty in a proper spirit we should not want many by-laws ; good inspection would take their place and would result in cheaper cottages. He would personally prefer that County Councils should build the cottages. He did not think that the cottages required could be built in any case without charge to the rates ; and he thought it reasonable that a charge on land values in towns should contribute to the necessary subsidy. He did not suggest that too much should be done. They could not subsidise the agricultural interest too far. A new era was beginning owing to electric development. We should have a rural population comprising many gardeners, small traders, and motor-car drivers. The Committee adjourned.

OVERHEAD WIRES, ST. PANCRAS.—In an arbitration case as between the Borough Council and the Post-office, Mr. Paul Taylor has given his award, with costs, in favour of the Postmaster-General for the erection of three 8¼-in. iron pillars, 35 ft. high, in Granby-street, Camden Town, for telephone and fire-alarm wires. The Council had refused their consent on the grounds that the posts would obstruct the traffic, and that over-head wires endangered the public safety, more particularly in times of storm or snow, and that in the public interest the wires should be laid below the surface. Mr. W. N. Blair, St. Pancras Borough Engineer, and Mr. W. F. Loveday, Engineer for Stoke Newington, gave evidence in support of the Council's contentions, but Mr. Taylor held the evidence tended to show that the over-head system was attended with less danger and inconvenience, and he expressed his opinion that if there was anything in the points raised to the contrary the matter should be submitted for legislative prohibition of all over-head wires.

METROPOLITAN WATER BOARD.—At their meeting on Friday last week a recommendation of the Works and Stores Committee was adopted to accept a tender by Messrs. James Byrom, Ltd., of Bury, Lancs, to construct reservoirs and execute other works at Fortis Green, Staines reservoirs communication, New River district. The returns for last May show that the mean daily supply per head to the total estimated population of 6,811,098 persons amounted to 32·2 gallons, the average daily supply being 219,193,000 gallons to 1,046,988 houses and other premises. Sir Melvill Beachcroft, chairman, acknowledged a vote of thanks on behalf of the Special Arbitration Committee, who reported that the arbitration proceedings, which are now terminated, have cost the Board a total sum of 255,584*l.* in respect of the forty-seven millions dealt with under arbitration.

HAMPSTEAD HEATH.—At their meeting on July 5 the Hampstead Board of Guardians carried unanimously a resolution moved by Mrs. Hepburn that there is urgent need of greater supervision by the police (whether the Metropolitan or that of the London County Council) since the present condition of the heath is a source of danger to ratepayers and their dependants who desire to use it for business or pleasure. It was further resolved to bring the matter to the notice of the Local Government Board, the London County Council, and the St. Pancras Guardians, with the object of preventing the misuse of the heath, more especially at night time by vagrants and misdemeanants.

ST. ANNE'S CATHOLIC CHURCH, BUXTON.—The wooden and stone steps of the sacrarium in this church have been replaced by a marble floor, with a mosaic predelia. Messrs. Burgess & Mills, marble and mosaic workers, of Manchester, have executed the work from the drawings of the architects, Messrs. C. & C. M. Hadfield, of Sheffield.

STATUE OF THE LATE MR. JOSEPH COWEN, NEWCASTLE.—On the 7th inst. a bronze statue of the late Mr. Joseph Cowen, for many years Member of Parliament for Newcastle, erected by public subscription in Westgate-road, Newcastle, was unveiled by the Right Hon. Viscount Ridley. It was cast by Messrs. Singer & Co., Frome, and the architect for the pedestal is Mr. C. R. R. Clark, of London ; Mr. Tweed being the sculptor.

A NEW YORK SKYSCRAPER.—Plans for an immense office building, to be the highest skyscraper in the United States, have, it is stated, been filed in New York. The site is at the junction of Broadway and Liberty-street. The building will have forty-one stories and, including the tower, will be 625 ft. high.

HACKNEY CENTRAL PUBLIC LIBRARY.—The

tenders for the central library building will be received by the Hackney Borough Council on the 26th inst. In view of the recess it has been decided to consider the tenders the same evening, and accept the most favourable one. The draft agreement between the Council and Mr. H. A. Crouch, the architect, has been approved.

UNIVERSITY OF LIVERPOOL.—The following degrees and certificates have just been conferred on students of the School of Architecture by the Chancellor, Lord Derby, in St. George's Hall, Liverpool. *Faculty of Arts.*—B.A. Degree with Honours, School of Architecture, first class—Maurice Lyon; L. K. Adams. Certificate in Architecture: First class—W. N. Adams, D. A. Campbell, A. C. Farmer, M. Ravenscroft. The above degrees and certificates exempt students from the intermediate examination of the R.I.B.A., and admit without preliminary work to the Royal Academy School. The Holt Travelling Scholarship of 50*l.* for measured drawings and designs made during the last year of study, was awarded to M. Lyon. The measured drawings included the Bank of England, Liverpool (by Cockerell), the Town Hall, parts of St. George's Hall, and the Petit Trianon, Versailles. Special scholarship 10*l.* to L. K. Adams, *proxime accessit*, H. Holt.

Legal.

ALLEGED OBSTRUCTION OF THE LIGHT OF ST. GEORGE'S CHURCH, HANOVER-SQUARE.

THE hearing of the case of Anderson and others *v.* Francis & Adams commenced before Mr. Justice Swinfen Eady in the Chancery Division on the 3rd inst., an action brought by the plaintiffs, the Rector and Churchwardens of St. George's Church, Hanover-square, for an injunction to restrain the defendants, the owners and occupiers of Nos. 40, 42, and 44, Maddox-street, W., opposite the north side of the church, from heightening the roof of their building so as to obstruct or diminish the light of the church.

Defendants denied that the plaintiffs had any cause of complaint.

Mr. Eve, K.C., and Mr. George Cann appeared for the paintiffs; and Mr. Micklem, K.C., and Mr. Stokes for the defendants.

Mr. Eve, in opening the case, said it was not one in which damages were asked for or one in which damages would be any compensation for the interference of which complaint was made. In George-street the church was entered by a porch, and there was no means of obtaining light from that end, while the windows at the east end were of stained glass. The result was that the church had to rely almost exclusively for light on the windows on the north and on the south sides. Experiments showed that the greater part of this light was received from the north side, and, therefore, a scheme to fill those windows with stained glass had been rejected. The ancient lights of the church was not contested, and the sole question was whether the story the defendants proposed to erect would obstruct the light to such a material extent as would justify the injunction being granted. The learned counsel said that in addition to the usual services there were many marriage ceremonies performed at St. George's, and the Rector and other officials would give evidence as to the diminution of light which would occur during the day-time if defendants' building was carried out.

The Rev. David Anderson, Rector of St. George's since February, 1891, examined by Mr. Eve, said that the church was erected in 1725. The light had already been affected by the defendants having converted an attic into a full story.

What would be the probable effect on your light if the defendants' building is completed according to the proposals of the defendants?—I consider it would be utterly disastrous.

Examination continued.

They had taken up this position as the trustees of a public building. The windows of the church were all plain transparent glass, with one exception, that there was a stained glass window at the east end of the church. He was present at the experiments made on June 20 last by their expert witnesses. He was standing in the middle aisle. A tarpaulin was put up, and its effect on the light was distinctly seen directly it was put up. The effect on the light of the church was something like drawing down a blind. If the defendants' proposed building was carried out the parts of the church particularly affected would be the pulpit, and the choir stalls would be certainly affected on the north side, and the lectern and the organist would also suffer. There would also be some loss of light to the communion table. The light of the pulpit at present was obscured to the extent of about one-third. If the alterations as proposed by the defendants were carried out it would have a disastrous effect on the light of the church, and they would have in the future to employ the use of artificial light where is similar circumstances in the past they had no need to do so.

Cross-examined,

The important windows were the four windows on the north side and the four windows on the south side. Up to 2 o'clock p.m. a strong light came into the building from the south side. Eleven years ago alterations were made in the seating arrangements of the church, and then a deputy chancel was formed and the pulpit moved slightly to the southward of the church. There was also a slight change made in the aisles. What was particularly complained of was that if the defendants' proposed building went up they would lose a certain amount of sky surface obtainable for the middle aisle.

Dr. Chas. Edward Jolly, the organist of the church, also gave evidence to the effect that the defendants' alterations had a prejudical effect on the light to the key-board of the organ.

Mr. A. J. Bolton, A.R.I.B.A., examined, said he had acted as Surveyor for the Rector and Churchwardens of the church for thirty years. The witness gave evidence formally proving the preparation of the plans pursuant to instructions for use by the plaintiffs in the present proceedings. He said the length of the church was 71 ft., and its width 63 ft., and it was capable of seating about 800 persons. If the defendants' proposed alterations were carried out the light of the church would be seriously interfered with.

Cross-examined,

The light coming to the church from the south was obstructed, but he could not give the angle of obstruction. No doubt there was a large amount of light to the church derived from the south-west window. He disputed the assertion that the main quantity of light came to the church from the south and south-west. In his opinion Maddox-street was not flooded with light in the afternoon; neither did he think that the only light the church received from the north was reflected light. When the test was carried out by putting up a tarpaulin where the proposed building would be, he found that it made a considerable difference to the light coming to the church. It darkened the church and affected the reading of the services. The church was a dark church, but would be much darkened by the defendants' building if heightened as proposed.

Mr. E. A. Gruning also gave evidence to the effect that serious harm would be done to the church by the proposed building, as it would reduce the duration of daylight in the church. In his opinion the northern windows were the principal source of light, though there was also light from the windows on the south at the eastern end, but not at the western. There it was obstructed by a house the front of which looked on George-street. He was present at the experiments and noticed that the putting up of the tarpaulin caused an immediate gloom, and also altered the direction of shadows on the floor from the southern to the northern side of the objects which caused them.

In cross-examination, the witness said that to block the southern windows would have no more effect than to block the northern. The former gave more direct sunlight, but that was no real advantage, for it required to be shaded. Questioned as to the angles of obstruction, the witness said that in effect a large building like a church could receive more injury to light from a lower building than could a small house, because the rays of light, having to penetrate further into the former, must come from a lower level. Thus 30 degrees in the case of a church would be equivalent to 45 degrees in an ordinary case. The obstruction of light would make the access to the gallery still more awkward than at present. In his opinion the defendants' building, if erected as proposed, would interfere with the ordinary use of the church through its affecting the daylight.

Mr. Alexander R. Stenning, an architect and surveyor, also gave evidence in support of the plaintiffs' case. He said he had visited the church last Tuesday, and, in his opinion, the defendants' building would make a material difference to the light of the church.

Other evidence having been given, the plaintiffs' case closed.

Mr. Micklem, in opening the defendants' case, said there would be a great discrepancy in the evidence, as he should call experts who would give a different version to that given on behalf of the plaintiffs. The defendants were the lessees of the premises in Maddox-street, and it was of the utmost importance to them that they should be able to erect the additional story they proposed. Maddox-street was one of the most valuable streets in London, and the rents there were enormous. The mere addition of the one story would mean a difference of 140*l.* a year to his clients' rent. It was common ground that the addition of the story proposed by the defendants would cause some diminution of light to the gallery windows of the church, but it would be such a slight diminution that, having regard to the light left, he submitted it was not a case in which the Court would grant an injunction.

His lordship said the short point he had to consider was this—would the effect of the defendants' proposed alterations affect the light to the church so as to substantially and materially interfere with the comfort of the worshippers and others who used the church?

Mr. Micklem agreed that that was the short point at issue. His case was that, having regard to the neighbourhood and the use to which the premises were put by the defendants, they would not be interfering with the light coming to the church by what they were doing. His submission was that the light at the side windows was ample for all church purposes. He contended that the law on the subject was not whether there was any diminution of light, but whether the amount of light that was left was ample for all ordinary purposes.

Mr. M. E. Collins, examined, said he was an architect and surveyor practising in Old Broad-street. He had made an examination of the church and buildings in Maddox-street. He was familiar with the buildings and surrounding neighbourhood. He had examined the church after the first part of the defendants' building was erected, and at that date the church was thoroughly well lighted in every respect except at the south-west corner under the gallery. The windows on the south and north side of the church gave a total lighting area of 1,250 ft. super, which was more than was absolutely necessary for a church which had a superficial area of 4,300 ft. as this church had. In his opinion, if the defendants' proposed building were carried out he did not think it would interfere in any undue way with the comfortable use of the church. In his opinion, the chief light of the church came from the south and north-west. The north light was a diffused light, and not the principal light. If the defendants' proposed building were erected the effect on the light of the church would be quite inappreciable.

Cross-examined by Mr. Eve, the witness said in his view the amount of light which would be taken from the church if the defendants' buildings were completed as now proposed was "immeasurable and inappreciable." At the present moment the church was perfectly well lighted, and that, in his opinion, was all that was required.

Mr. H. Chatfeild Clarke, architect, examined said he had visited the church on May 28 and 30, and June 20 last. In his opinion it was an exceptionally well-lighted church for a town church. It had a very large glass area in comparison with the wall area. He differed entirely from Mr. Gruning on this point, and thought the church was an extremely well-lighted one. In his opinion, the defendants' proposed building would not materially or substantially affect the light of the church. When he visited the church he was struck with the large amount of light it received from the north-west.

Mr. S. E. Adams, an architect, who prepared the modified plans for the defendants' buildings, gave evidence to the effect that they represented the *minimum* of defendants' requirements if the upper story was to be of any use at all. The plan, if carried out, would have very little effect on the light, and would not interfere with the comfort of those using the church. He did not think that the photographs put in as evidence had been taken in a manner likely to show the conditions fairly.

Mr. J. Douglas Matthews, an architect, gave evidence to the effect that the present new building of the defendants made no difference to the light, but the proposed addition would make some, though not so as to interfere with reasonable comfort. The plan before modification would have caused material interference. The witness admitted that he had not observed the state of things existing before the alterations were commenced.

At the close of the defendants' case, Mr. Stokes addressed his lordship on behalf of his clients. He submitted that the plaintiffs had not made out a case of nuisance, the question being not how much light was abstracted, but whether a sufficient quantity was left. He said there was ample window space in the church, the greater part of it on the gallery level. A church stood in a different position to that of a dwelling-house, as a church was only used at certain times. It could not be suggested that the obstruction would interfere with the services held in the morning or the afternoon; inconvenience could only be felt during the evening services at the time of the year when the afternoons were short. Defendants could not dispute that their proposed building would interfere in some slight degree with the light of the church, but whether it would amount to such a diminution as to create a nuisance was another thing.

His lordship: The short point is whether you occasion a nuisance to the church by what you are doing?

Mr. Stokes agreed. He submitted that the injury, if there was any, affected only the easternmost windows on the north side, and in view of the quantity of light available from other directions, he submitted that the defendants were entitled to succeed on the principle laid down by Lord Justice Farwell in the case of "Higgins *v.* Betts."

Mr. Eve, in replying on behalf of the plaintiffs, submitted that his clients had a good cause of action, and that the remedy was by injunction and not by damages. The whole case was a practical illustration of the truth of the problem that it

was the last straw which broke the camel's back. But for the imposition of the last straw the action would not have come before his lordship. The learned counsel, commenting on the evidence given, said that as far as theories went the theorists were pretty evenly balanced, and in setting off the one group of expert witnesses against the other, there remained on the side of the plaintiff three witnesses—the Rector, the organist, and the verger—whose personal experience enabled them to give that practical testimony which was worth far more than scientific evidence. The duties of these three persons took them constantly to the church, and nobody could suggest that there was an attempt by any one of these persons to exaggerate. One question on which opinions were much divided was whether the church was a well lighted one, but Lord Justice Vaughan Williams, in the case of "Kine *v.* Jolly," had pointed out that "well lighted" was a comparative term, depending for its meaning on opinions and circumstances. It was on such a point as this that the evidence of those constantly using the church was of the greatest weight. He submitted that the church could not be defined as "well lighted." The Rector, organist, and verger were able to speak of the light of the church not on particular days when they visited the church, but they were able to speak of the light of the church from their general experience extending over a series of years. It was clear that the church was not a well lighted one. He agreed that as the law stood it seemed to be lawful to take away a certain portion of a man's light so long as sufficient light was left. He did not know whether that applied to other classes of property.

His lordship: The short answer to that is that no one has a right to any property in light.

Mr. Eve said he must, of course, accept the law as it was, and it was not his duty to criticise it. What his lordship had to consider was that this church was used every Sunday of the year for services, for week-day services, and for marriages, and other matters. Taking the average amount of light which the church enjoyed the whole year, was what the defendants were doing and proposing to do likely to materially detract from the comfortable and convenient use of the church? If his lordship accepted the conclusion to which Mr. Anderson and Dr. Jolly had come, that the immediate result of the defendants' building would be to necessitate the larger use of artificial light during the services, he would probably hold that the effect of the defendants' building was to render the church less comfortable. A building of this sort was lighted from both sides for the purpose of bringing about a general result in the church for the convenience of those who had to use it. It would be a serious interference with the use to which the light in a building of that sort was to be put if any one did anything which destroyed or disturbed the equilibrium of the light coming from each side. In the present case it would be extremely difficult to measure the damages, because a church was not a property to which one could attach any rental value. It would be difficult to estimate in compensation the amount of the damages. On the whole facts of the case he asked his lordship to say that the plaintiffs had a good cause of action, and to grant an injunction to restrain the defendants from erecting their building so as to cause a nuisance.

His lordship said he would take time to consider his decision.

Judgment was accordingly reserved.

BECKENHAM BUILDING DISPUTE.

THE case of Whitehouse *v.* Hugh came before the Court of Appeal composed of Lords Justices Vaughan Williams, Romer, and Fletcher Moulton last week, on the appeal of the plaintiff from a judgment of Mr. Justice Kekewich in the Chancery Division. (The case was reported in the *Builder* of December 2, 1905.)

In this case the plaintiff, a market-gardener carrying on business at No. 19, Mackenzie-road, Beckenham, brought the action to restrain the defendant from building on a roadway adjoining the plaintiff's premises, in alleged contravention of a building scheme adopted by the Birkbeck Freehold Land Society in 1878, and from interfering with the plaintiff's use of the roadway. The plaintiff also sought to restrain the defendant from building so as to obstruct his ancient lights, but on the present appeal the question of obstruction of the plaintiff's ancient lights was not raised.

It appeared that the plaintiff purchased the freehold of his premises from a Mr. Chamberlayne in 1885. At this time the north-western boundary of plaintiff's premises was laid out as a road which led from Mackenzie-road to a level crossing on the London Chatham and Dover Railway. The plaintiff's house was built on plots 351 and 352, two out of three plots purchased from the society by Mr. Chamberlayne in 1879. On the plan in the conveyance by the society to Mr. Chamberlayne the roadway was designated as a vacant space between lots 352 and 355. By the conveyance the society reserved to itself the right of allowing a variation in the plans and conditions. The roadway had only been roughly made up, and, by reason of its not being much used, had been allowed to fall out of repair. This road, after it crossed the railway, led to a meadow, to which there was no other means of access for vehicles. In 1894 the society purchased and laid out the meadow as a building estate, and by an arrangement the railway company were released from maintaining the level crossing, and the company subsequently removed the gates of the crossing and erected an iron fence without gates. In 1897 the society erected a fence at the Mackenzie-road end of the roadway, and conveyed the plots occupied by the roadway to the defendant's predecessor in title, and since that date there had been no means of communication between Mackenzie-road and the roadway, except by a gate in the fence, which was kept locked. The defendant, in 1904, purchased from plaintiff's predecessor in title No. 21, Mackenzie-road, which was built on plot 355. He also purchased plots 353 and 354, over which the roadway passed, and in November last he commenced to dig up the roadway for the purpose of laying the foundations of two houses he proposed to erect. The plaintiff alleged that defendant by so building was depriving him of the use of the roadway and the light and air coming over it to his premises. He also said that when the defendant's buildings were completed they would so interfere with the light coming to his premises as to constitute an actionable nuisance. Plaintiff further said that the society had dedicated the roadway in question to the public. Mr. Justice Kekewich held that no representation had been made that there was a road or that the vacant space between lots 352 and 355 should remain vacant. He said that it could not be contended that the society could not allow defendant to build houses on plots 353 and 354, and, therefore, plaintiff was not entitled to restrain the defendant from so building. He further held that upon the question of dedication to the public of the road, plaintiff's case broke down, and that there would be no such obstruction as would substantially lessen the plaintiff's comfortable enjoyment of his house. He accordingly entered judgment for the defendant with costs. Hence the present appeal of the plaintiff.

At the conclusion of the arguments of counsel, their lordships affirmed the decision of Mr. Justice Kekewich, and dismissed the appeal with costs.

Mr. E. Todd appeared for the appellant, and Mr. P. Ogden Lawrence, K.C., and Mr. Cozens-Hardy for the respondent on the appeal.

ACTION BY BUILDING OWNERS AGAINST BUILDER.

THE case of Abbey and others *v.* Galer came before the Court of Appeal composed of the Lord Chancellor, the Master of the Rolls, and Lord Justice Cozens-Hardy, on the 5th inst., on the appeal of the defendant from an order of Mr. Justice Bucknill in Chambers dismissing the defendant's appeal from the order of the Master giving leave to the plaintiffs to sign judgment under Order XIV.

Counsel in support of the appeal said his notice of motion asked that the appeal should be allowed, and that the proceedings in the action should be stayed under sect. 4 of the Arbitration Act. The plaintiffs were brewers, and the defendant was a builder. In July, 1905, a building agreement was entered between the parties whereby the defendant was let into possession of certain property belonging to the plaintiffs at Tottenham, on terms which were shortly as follows:—The defendant had to pay a rent during the time of his occupation of 24*l.* 18s. a year; he was to erect on the plots various houses and a shop at a minimum cost of 230*l.* each; during the erection of the houses, the plaintiffs, the building owners, were to make defendant advances from time to time not exceeding 135*l* on each house, and upon completion of the houses the defendant was to be entitled to a conveyance of these houses from the plaintiffs upon payment of 62*l.* 2s. 6d. for each house built, and, in addition, on payment of the advances made by the building-owners plus 6 per cent. on the amount of such advances. There was a provision that seven houses and one shop were to be completed by March 20, 1906, and a further provision that upon default by the defendant under the agreement the plaintiffs should be entitled to re-enter and serve the defendant with notice to determine the agreement altogether. Further, clause 18 of the agreement provided that if any dispute should arise between the parties as to the construction of the agreement or as to anything to be done thereunder, the matter should be referred to arbitration. Various payments were made to the builder under the agreement, and on October 5, 1905, another agreement, which was practically in the same terms as the July agreement, was entered into. This agreement referred to seven other houses and shops on the same estate, which had to be completed by June 24, 1906. Clause 7 of this agreement provided that the plaintiffs were not bound to make any advances exceeding 1,400*l.* in respect of the works executed under that agreement and the other agreement. Under the July agreement the plaintiffs were under no obligation to make a total advance in excess of 1,000*l.* His (counsel's) contention was that the two agreements became merged on the signing of the second agreement, and the time fixed for completion was postponed until June 24, 1906. Various complaints were made from time to time that the defendant did not proceed with the work as he should, and negotiations were entered into with a view to prepare a supplemental agreement, and an agreement was in fact prepared but not executed. The next thing which happened was the issue of the writ on May 14, under which the plaintiffs claimed possession, the plaintiffs alleging that the tenancy was determined by notice to quit on May 11, 1906. He submitted that neither the master nor the judges had power to make the order they had for summary judgment, and that the defendant was entitled to have the matters in dispute referred to arbitration in accordance with the provision contained in the clause in the agreement.

Counsel for the respondents on the appeal said that his clients would be willing to allow defendant to resume possession within a month if he performed his obligations under the agreement.

On the respondents giving an undertaking to this effect their lordships dismissed the appeal with costs.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 18.—By TALBOT & WHITE & T. H. NEWMAN (at Billericay).

Ramsden Bellhouse, etc., Essex.—"Allen's Farm," 102 a. 3 r. 4 p., f.	£1,750
"Watt's Farm," 12 a. 2 r. 19 p., f.	770
Part of "Cox Green Farm," 46 a. 1 r. 18 p., f.	1,000
"Red Rose Holding," 22 a. 3 r. 12 p., f.	500

June 19.—By TALBOT & WHITE & T. H. NEWMAN (at Wickford).

Wickford, Essex.—Freehold building land, 35 a. 2 r. 17 p.	2,400
"Stileman's Farm," 95 a. 0 r. 25 p., f.	2,600
Ten enclosures, 39 a. 0 r. 24 p., f.	2,330

June 20.—By TALBOT & WHITE & T. H. NEWMAN (at Braintree).

Rayne, Essex.—"Haverings," and 135 a. 0 r. 35 p., f.	2,500
"The Street Farm," 29 acres, f.	440
"Goulds" and "King's" Farms, 150 a. 1 r. 2 p., f.	2,675
"Moors Farm," 71 a. 2 r. 17 p., f.	630
"The Common Farm," 25 a. 1 r. 11 p., f. and c.	640

June 21.—By MERRY & NORMAN (at Banbury).

West Stuttford, Oxon.—Freehold farm, 125 a. 3 r. 16 p.	2,700

June 22.—By TALBOT & WHITE & T. H. NEWMAN (at Chelmsford).

Stock, Essex.—"Stock Mill" and 4 a. 1 r. 32 p., f. and c.	650
"Bishop's Farm," 30 a. 3 r. 11 p., f. and c.	500
South Hanningfield, Essex.—"Great Preston's Farm," 208 a. 2 r. 3 p., f.	2,000

June 23.—By TALBOT & WHITE & T. H. NEWMAN (at Southend).

Rayleigh, Essex.—The Rayleigh Brewery and 5 a. 3 r. 36 p., f.	1,450

June 25.—By MERRY & NORMAN (at Rugby).

West Haddon, Northants.—"Church House Farm," 201¼ acres, f., y.r. 250*l.* 12s. 6d.	4,500

June 26.—By HOLLIS & WEBB (at Leeds).

Adel, Yorks.—"Cookridge Towers," and 13 acres, f.	5,000

June 28.—By W. DAY & SONS (at Maidstone).

Maidstone, Kent.—1, 3, 7, and 11, Foley-st., f.	935
Loose, Kent.—Loose-rd., "Week's Cottages" (nine), f., w.r. 98*l.* 16s.	1,295

By ROBERT NEWMAN (at Uxbridge).

Harlington, Middx.—Hayes Station-rd., four plots of land, f.	260

By HOLLIS & WEBB (at Harrogate).

Nidderdale, Yorks.—"High Longside Farm," 117 acres, f.	2,585
Grafton, Yorks.—"Hundayfield Farm," 134 a. 2 r. 35 p., f., y.r. 235*l.*	5,300
Darley, etc., Yorks.—Freehold estate (seven farms), 776 acres	4,940

June 29.—By HARRY BALL (at Bedford).

Bedford.—34, Grafton-rd., f., y.r. 23*l.*	380
24, Wellington-st. (s.), f., o.r. 25*l.*	450

By C. J. PARRIS (at Tunbridge Wells).

Mayfield, Sussex.—"Holmstall Farm," 25 a. 3 r. 35 p., f.	1,330
Two freehold building sites, 10 a. 2 r. 5 p.	505
"Stone House" and 9 a. 2 r. 37 p., f.	570
"Dapsland Farm," 14 a. 0 r. 2 p., f.	650

June 30.—By CHAMPION & BUSBY with FENN & Co. (at Colchester).

Ardleigh, Essex.—"Slough Farm," 171 a. 1 r. 21 p., f.	2,500
"Collier's Wood Farm," 211 a. 1 r. 23 p., f.	2,500

By H. J. WAY & SON (at Newport).

Niton, Isle of Wight.—"Sunnyside," two cottages and plot of land, f.	670

July 2.—By DAVID BURNETT & Co.

Stratford.—58 to 64 (even), The Broadway (s.), area 17,600 ft., f., y.r. 493*l.*	14,500
52 and 54, Broadway (s.), f., y.r. 210*l.*	7,000
Leytonstone-rd., "The Royal Oak" b.h., f., y.r. 65*l.*	1,900
91, 93, and 95, Leytonstone-rd (s.), f., y.r. 97*l.*	2,040
Maryland-st., a block of land, area 9,400 ft., f.	1,180
Stratford.—1 to 9, Maryland-st., f., w.r. 198*l.* 18s.	1,610
Plaistow.—24 to 38 (even), James-st., f., w.r. 152*l.* 2s.	1,310
42, Balaam-st., f., y.r. 45*l.*	370
Bethnal Green.—58 to 70 (even), Collingwood-st., f., w.r. 182*l.*	1,180

SALES OF PROPERTY.—*Continued on page 61.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Competition.

JULY 28.—**Sheffield.**—BATHS.—Architects practising within the Sheffield City boundaries are invited to submit competitive drawings for public baths proposed to be erected at Primrose Meadows. The competition will be conducted and the awards made by an assessor appointed by the City Council. Premiums of 30*l.*, 20*l.*, and 10*l.* will be awarded to the authors of the schemes placed respectively first, second, and third in order of merit. Conditions of competition, with instructions and schedule of requirements, etc., may be obtained from Mr. Henry Sayer, Town Clerk, Town Hall, Sheffield, upon payment of a deposit of 1*l.* 1*s.*

Contracts.

BUILDING.

JULY 14.—**Bradford.**—ALTERATIONS TO HOUSE.—Alterations to house at Westgate Hill, Bradford. Names to Messrs. Fairbank & Wall, architects, Craven Bank-chambers, Bradford, on or before July 14, when quantities will be forwarded.

JULY 16.—**Alfreton.**—SCHOOL.—Derbyshire C.C. invite tenders for school for 400 infants at Alfreton. To be delivered not later than July 16. Quantities will be supplied on application to Mr. Percy B. Houfton, architect, Chesterfield.

JULY 16.—**Brighton.**—REPAIRS, ETC.—Brighton Education Committee invite tenders for internal and external repairs, painting, etc., to certain of the schools, to be carried out during the month of August next. The Committee are also prepared to receive tenders for the installation of the electric light in the boys' department of the York-place school. Specifications of the work may be seen, and forms of tender obtained, at the offices of the Surveyors to the Committee, Messrs. T. Simpson & Son, 17, Ship-street, Brighton, between the hours of 10 a.m. and 5 p.m. Sealed tenders, endorsed "Tenders for Repairs, Painting, etc.," to be addressed to Mr. John Carden, Clerk to the Committee, Offices of the Committee, 54, Old-steine, Brighton, and delivered at the offices of the Committee, 54, Old-steine, Brighton, on or before July 16, at 1 o'clock p.m.

JULY 16.—**Carlisle.**—CHURCH ROOMS.—The various works required in the erection of Church rooms at Heads Nook. Plans and specification can be seen, and forms of tender obtained, at offices of Mr. J. H. Martindale, F.R.I.B.A., architect, Eaglesfield Abbey Rooms, Castle-street, Carlisle, during office hours from July 9 to July 16, when tenders are to be sent before 10 a.m.

JULY 16.—**Dinnington.**—CLUB.—The building of Dinnington Workmen's Social Club. Tenders, with a deposit of 1*l.*, on or before July 16 to Mr. Wm. Whiteside, Secretary, Wideopen, Dudley, R.S.O. For Schedules and full particulars apply Messrs. Marshall & Tweedy, architects, Eldon-square, Newcastle-on-Tyne.

JULY 16.—**Sandiacre.**—SCHOOL.—Derbyshire C.C. Education Committee invite tenders for the erection of school at Sandiacre, to accommodate about 320 children. Drawings, specification, agreement, etc., may be seen at the office of Mr. George H. Widdows, A.R.I.B.A., Architect to the Committee, County Education Office, St. Mary's-gate, Derby, between the hours of 10 a.m. and 4 p.m., except on Saturday, when they will be on view from 10 a.m. to 12 noon. A copy of the bill of quantities, specification, conditions of contract, and form of tender can be obtained at the architect's office upon payment of 1*l.* 1*s.* Sealed tenders, in envelopes provided for the purpose, endorsed "Tender for New Council School, Sandiacre," must be delivered to the architect, at his office, not later than 5 p.m. on July 16.

JULY 16.—**Senghenydd.**—HOUSES.—Twenty dwelling-houses at Senghenydd for the Trustees of the Gwernymilwr Building Club. Plans and specification may be seen with the architect, Mr. G. L. Watkins, architect, Rectory-road, Caerphilly. Sealed and endorsed tenders to be delivered to the Secretary, Mr. R. Humphreys, 131, Commercial-street Senghenydd, on or before 12 o'clock noon, July 16.

JULY 16.—**Southampton.**—BEDROOM.—The Guardians of South Stoneham Union invite tenders for the erection of cook's bedroom at the Union Workhouse, Westend, Southampton, in accordance with the plan, specification, and conditions of contract prepared by Messrs. W. H. Mitchell, Son, and Gutteridge, architects, of 9, Portland-street, Southampton. The plans, etc., may now be seen, and all particulars obtained, at the offices of the architects. Sealed tenders, on the form provided, are to be sent to Mr. E. T. Westlake, Clerk to the Guardians, 20, Portland-street, Southampton, not later than 12 noon on July 16, endorsed "Tender for Cook's Bedroom."

JULY 17.—**Edinburgh.**—TENEMENTS.—Edinburgh Corporation invite estimates for the mason, carpenter, smith, slater, plumber, plaster, painter, and asphalt works to be executed in the reconstruction of tenements, Greenside-row. Schedules of quantities and all particulars from the Burgh Surveyor. Sealed offers, endorsed "Tender for Reconstruction, Greenside-row," must be lodged with Mr. Thomas Hunter, W.S., Town Clerk, City-chambers, Edinburgh, not later than July 17.

JULY 17.—**Halifax.**—ALTERATIONS TO SHOPS.—Halifax Markets Committee invite tenders for the execution of the joiner's work required in connexion with alterations to shops in the Market Hall, and shop in Piece Hall. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax. Tenders, endorsed "Shops, Market Hall or Piece Hall," as the case may be, must be sent to Mr. Keighley Walton, Town Clerk, not later than 12 o'clock noon on July 17.

JULY 17.—**Llanwrtyd Wells.**—CHAPEL.—For erection of new Calvinistic Methodist chapel, Llanwrtyd Wells. Plans and specification may be seen with the Rev. Rhys Evans, Chapel House, Llanwrtyd Wells, and at the offices of the architect, Mr. W. Beddoe Rees, architect, 3, Dumfries-place, Cardiff, from whom bills of quantities may be obtained. Tenders to be sent to Rev. Rhys Evans on or before July 17.

JULY 17.—**Machynlleth.**—RENOVATION OF CLOCK TOWER.—The renovation of the town clock tower of Machynlleth, for the Machynlleth U.D.C. Specifications and further particulars may be obtained of Mr. John Rowlands, Clerk to the Council, Machynlleth, Montgomery. Tenders to be delivered or sent in not later than July 17.

JULY 17.—**Milton Abbott.**—CHAPEL ADDITIONS.—For additions and alterations to Milton Abbott Wesleyan chapel. The drawings, specifications, and conditions may be seen by applying to the caretaker. Tenders must be sent to Mr. Walter Frise, Leigh Ball Cottage, Milton Abbott, Tavistock, not later than July 17. Mr. Ernest Wise, M.S.A., architect, Launceston.

JULY 17.—**Treherbert.**—ALTERATIONS.—Alterations to the front of the Conservative Club, Treherbert. Plans and specifications can be obtained by applying to the Secretary; or Mr. Jacob Rees, architect, Pentre. All tenders to be in the hands of Secretary by July 17.

JULY 18.—**Dublin.**—DINING-HALL.—The Board of Public Works, Ireland, invite tenders for erecting and completing a new temporary dining-hall at the R.I.C. Depôt, Phœnix Park, Dublin. Tenders will be received up to, but not later than, 10 a.m. on July 18. The plans and specification can be seen at office of Mr. H. Williams, Secretary, Office of Public Works, Dublin, where also forms of tender may be obtained. The envelope containing the tender must be endorsed.

JULY 18.—**Dublin.**—STORE.—South Dublin Guardians invite tenders for the fitting-up of a butter store in the workhouse, in accordance with specification prepared by the Clerk of Works. Tenders to be lodged with Mr. John P. Condon, Clerk of the Union, Board Room, James's-street, not later than 12.30 o'clock p.m. on July 18.

JULY 18.—**Leyland.**—HOUSES, ETC.—The Leyland and Farington Industrial Co-operative Society, Ltd., invite tenders for the erection of five houses and a shop, near Leyland Station. Plans may be seen, and bills of quantities obtained, at the Secretary's office, Chapel-brow, Leyland, on payment of 10*s.* Tenders must be delivered before 6 p.m. on July 18.

JULY 18.—**Teddington.**—OFFICES.—Teddington U.D.C. invite tenders for the erection of additional offices at Elmfield-house, Teddington. Plan and specification may be seen on application to Mr. M. Hainsworth, Surveyor, Council Offices, Teddington. Tenders, endorsed "Offices," must be sent to Mr. G. H. Salmons, Clerk, Elmfield House, Teddington, not later than July 18.

JULY 18.—**Whitley.**—SCHOOL ADDITIONS.—The Administrative Sub-Committee for the Runcorn Rural District invite tenders for alterations and additions to the school buildings, Whitley, near Runcorn. Plans and specification can be seen at the office of Mr. H. Beswick, County Architect, Newgate-street, Chester, and quantities obtained on deposit of 1*l.* Tenders to be sent to Mr. George F. Ashton, Clerk, 71, High-street, Runcorn, on or before July 18, endorsed "Tender for Works at Whitley."

JULY 19.—**Lesmahagow.**—SCHOOL WORKS.—Lesmahagow School Board invite tenders (1) for new bathroom at Bent School-house, and alterations of school latrines; (2) for new bathroom at Blackwood School-house; (3) for new water closets at Blackwood School; (4) for alteration of front lobby and lavatory at Lesmahagow Senior School. Separate offers required for mason and brick works, joiner works, plumber works, plaster and cement works. Plans and specifications may be seen at the different schools or school-houses, and offers to be lodged with Mr. J. N. Gilmore, Clerk, School Board Office, Lesmahagow, marked "Offer" on outside, not later than July 19, at 12 noon.

JULY 19.—**Somerset.**—BUNGALOW.—For the erection of a bungalow residence, on the Crowcombe Estate, Somerset, for Mr. G. Connock Dyke. Plans and specification may be seen at Crowcombe Station, on application to Mr. John A. Tozer, and further particulars from the architect, to whom tenders are to be delivered on or before July 19. Mr. George C. Strawbridge, architect, 28, Alma-street, Taunton.

JULY 20.—**Alnwick.**—ALTERATIONS.—Tenders (single or whole) are required for alterations to No. 1, Seaview, Craster North Side. Plans and specifications may be seen at office of Mr. M. Temple Wilson, architect and surveyor, Alnwick, and copies thereof upon application to Mr. Chas. Archbold, No. 8, Craster South Side. Tenders are to be delivered to architect on or before July 20.

JULY 20.—**Belfast.**—WAREHOUSES.—Building and completing a block of warehouses at Franklin-street, Brunswick-street, and James-street South. Quantities may be had on application to Mr. S. C. Hunter, building surveyor, 2, Wellington-place, Belfast. Plans, etc., may be inspected at office of Mr. Henry Seaver, B.E., M.R.I.A.I., architect, Scottish Temperance-buildings, Belfast. Sealed tenders, endorsed "Warehouses," to be lodged with architect not later than 12 o'clock noon, July 20.

JULY 20-23.—**Kirkmichael.**—RENOVATION OF CHURCH.—The mason, carpenter, slater, lath and plaster, and painter and glazier works to be done in connexion with the renovation of the parish church of Kirkmichael. Plans and specifications to be seen with Mr. John Robertson, architect, Inverness; also copies of both plans and specifications to be seen with the Rev. Mr. Fraser, The Manse, Kirkmichael, Ballindalloch, from July 5 to July 20, and tenders to be lodged with Mr. Robertson, on or before July 23.

JULY 20.—**Stretford.**—COTTAGES.—Stretford U.D.C. invite tenders for the erection of twenty pairs of semi-detached cottages in Lacy-street, Stretford. Plans, form of tender, etc., may be seen, and bills of quantities obtained, at the offices of the architects, Messrs. John Bowden & Co., 14, Ridgefield, Manchester, upon payment of 1*l.* Tenders to be sent to the Chairman, Sanitary Committee, at the Council Offices, Old Trafford, on or before July 20, endorsed "Tender for Cottages."

JULY 21.—**Crompton.**—SEWAGE WORKS BUILDINGS, ETC.—Crompton U.D.C. invite tenders in connexion with their sewage works at New Hey for the following:—Contract No. 1.—Erection of buildings to contain sludge-pressing machinery and other works in connexion therewith. Contract No. 2.—Supply and installation of suction gas producer plant, gas engine, pump, air compresser and receiver, water tanks, and all shafting, piping, etc., in connexion therewith. Contract No. 3.—Supply and installation of sludge press, dams, mixer, cast-iron overhead sludge tank, and all piping, etc., in connexion therewith. Plans, specifications, and general conditions may be seen, and forms of tender, with all necessary information, obtained on application to the Council's Engineer for the scheme, Mr. J. P. Wilkinson, M.Inst.C.E., 301 to 304, Cathedral-street, Manchester, accompanied by a deposit of 1*l.* 1*s.* in respect of each contract. Sealed tenders, endorsed "New Hey Sewage Works —Contract No ——" (as the case may be), must be addressed to Mr. F. F. Gartside, Clerk to the Council, Town Hall, Shaw, near Oldham, and be delivered not later than 10 a.m. on July 21.

JULY 21.—**Guildford.**—STORE, ETC.—Guildford Guardians invite tenders for (*a*) the construction of a small store, external shelter, and a pent roof in connexion with the new casuals block; and (*b*) external painting at the Infirmary buildings, both at the Union Workhouse, Guildford. Specifications and plans of the proposed work can be seen on application to Mr. Edward L. Lunn, architect, 36, High-street, Guildford. Sealed tenders, endorsed "Building Work at Casuals Block" and "Painting Infirmary," are to be sent in to Mr. W. S. V. Cullerne, Clerk to the Guardians, at the Union Offices, Commercial-road, Guildford, not later than 10 o'clock a.m. on July 21.

JULY 23.—**Awbridge.**—SCHOOL WORKS.—Southampton C.C. invite tenders for sundry small works of repairs, painting, provision of lavatory accommodation, erection of offices, etc., at Awbridge Council school. Plans and conditions of contract may be seen, and specification obtained, at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays, 9 a.m. and 1 p.m.). Plans and conditions of Contract may also be seen at the school. A deposit of 1*l.* 1*s.* will be required for a copy of the specification. Deposits must be made by cheque payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Awbridge Council School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester, not later than 10 a.m. on July 23.

JULY 23.—**Bexley.**—CAR-SHEDS, ETC.—Bexley U.D.C. invite separate tenders for:—(1) The extension of the existing car-shed to form a paint shop; (2) the erection of a steel structure for a repairing shop. Drawings, specification, and bill of quantities may be seen at the manager's office, Car-sheds, Bexley Heath. Copies of the bill of quantities will be supplied on payment of 10*s.* Sealed tenders marked "(1) Paint Shop," "(2) Repairing Shop," as above, to be delivered to the Clerk, Mr. T. G. Baynes, Oak House, Bexley Heath, Kent, not later than noon July 23.

JULY 23.—**Braishfield.**—SCHOOL WORKS.—Southampton C.C. invite tenders for sundry small works of repairs, painting, and provision of lavatory accommodation at Braishfield Council school. Conditions of contract may be seen, and specification obtained, at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). Conditions of contract may also be seen at the school. A deposit of 1*l.* 1*s.* will be required for a copy of the specification. Deposits must be made by cheque payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Braishfield Council

School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester, not later than 10 a.m. on July 23.

JULY 23.—**Cosham.**—SCHOOL WORKS.—Southampton C.C. invite tenders for sundry small works of erection of buttresses, new fencing, tie rods, distempering, new urinal, and drains, at Cosham infants' Council school. Plans and conditions of contract may be seen, and specification obtained, at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of 1*l.* 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Cosham Infants' Council School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester, not later than 10 a.m. on July 23.

JULY 23.—**Darranlas.**—SCHOOL.—Mountain Ash U.D.C. Education Committee invite tenders for the erection of a mixed school (to accommodate 400 children), with the necessary offices, boundary walls, etc., at Darranlas, Mountain Ash. Plans and specifications may be seen, and forms of tender and bills of quantities obtained, on application to the architect, Mr. W. H. Williams, Town Hall, Mountain Ash, upon the deposit of 2*l.* 2s. The bill of quantities is to accompany the tender, but in a separate sealed and endorsed envelope. Sealed tenders and sealed bills of quantities, endorsed "Darranlas Mixed School," to be received by Mr. A. Morgan, Director of Education, Town Hall, Mountain Ash, not later than July 23.

JULY 23.—**Fareham.**—REPAIRS, ETC.—Southampton C.C. invite tenders for sundry small works of repairs, external and internal painting, ventilation, etc., at Fareham Council School. Plans and conditions of contract may be seen, and specification obtained, at the Office of Mr. W. J. Taylor, County Surveyor, the Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays, 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of 1*l.* 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Fareham Council School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester not later than 10 a.m. on July 23.

JULY 23.—**Funtley.**—SCHOOL WORKS.—Southampton C.C. invite tenders for sundry small works of gravelling, enlarging gateway, erection of cloakrooms and lavatories, drainage, corrugated iron offices, conversion of buildings for coal store, etc., at Funtley Council School. Plans and conditions of contract may be seen, and specification obtained, at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays, 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of 1*l.* 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Funtley Council School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester, not later than 10 a.m. on July 23.

JULY 23.—**Halehead.**—LIGHTHOUSE.—The Upper Mersey Navigation Commissioners invite tenders for a new lighthouse at Halehead, and beacon near Halehead, on the Mersey. Plans and specifications can be seen at the office of Mr. J. A. Saner, Northwich. Tenders to be sent in by 9 a.m. on July 23 to Mr. J. Meadowcroft, Clerk to the Commissioners, Office of the Commissioners, Runcorn.

JULY 23.—**Portchester.**—SCHOOL WORKS.—Southampton C.C. invite tenders for sundry small works of gravelling, erection of offices, ventilation, etc., at Portchester Council School. Plans and conditions of contract may be seen, and specifications obtained, at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, on and after July 9, between the hours of 9 a.m. and 5 p.m. (Saturdays, 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of 1*l.* 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Portchester Council School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester, not later than 10 a.m. on July 23.

JULY 23.—**Waterloo.**—SCHOOL WORKS.—Southampton C.C. invite tenders for sundry small works of painting and decorating, new drains, new offices, ventilation, etc., at Waterloo Council school. Plans and conditions of contract may be seen, and specification obtained at the office of Mr. W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of 1*l.* 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants C.C., and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Waterloo Council School," are to be delivered to Mr. H. Barber, Clerk of the C.C., The Castle, Winchester, not later than 10 a.m. on July 23.

JULY 24.—**Mutley, Plymouth.**—POLICE AND FIRE STATION.—For the erection and completion of a police and fire station at Ford Park, Mutley. Plans and specifications can be seen, and forms of tender and bills of quantities obtained, on deposit of 2*l.* in cash. Sealed tenders, accompanied by the fully-priced out bills of quantities, to be delivered at the offices of Mr. James Paton, Borough Engineer and Surveyor, Borough Engineer's Office, not later than 5 p.m. on July 24.

JULY 25.—**Ashford.**—WALLING.—Ashford U.D.C. invite tenders for the erection of a Kentish rag-stone boundary wall, about 1,200 ft. long, at its cemetery, Canterbury-road, in accordance with plans and specification, which may be seen. Form of tender, and any other information, obtained on application to Mr. William Terrill, surveyor, North-street, Ashford, Kent. Sealed tenders, endorsed "Cemetery Walling," to be sent to Mr. F. Hughes Hallett, solicitor, Clerk to the Cemetery Committee, not later than 5 p.m. on July 25 at his office, 11, Bank-street.

✱ JULY 25.—**Dartford (Kent).**—ALTERATIONS.—The Metropolitan Asylums Board invite tenders for structural alterations to the laundries at Darenth Asylum, Dartford, Kent, in accordance with drawings and specification prepared by Mr. W. T. Hatch, Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender may be inspected at the Office of the Board, Embankment, E.C., on and after July 16, and can then be obtained on payment of 1*l.* Tenders, addressed as noted on the form, must be delivered at the Office of the Board before 10 a.m., July 25.

✱ JULY 25.—**Sutton.**—STABLING, ETC.—The Metropolitan Asylums Board invite tenders for stabling and other buildings on the Belmont Asylum Estate, Sutton, Surrey. Copy of specification, conditions of contract, bills of quantities, and form of tender can be obtained, on payment of 1*l.*, at the Office of the Board, Embankment, E.C. The drawings can be seen at the offices of Messrs. T. W. Aldwinckle & Son, architects, 20, Denman-street, London Bridge, S.E. Tenders to be delivered at the Office of the Board by 10 a.m., July 25.

JULY 26.—**Nantymoel.**—CO-OPERATIVE PREMISES.—New stables, carthouse, yard, and boundary walls; also new butcher's shop, and conversion of existing stables into shoemaker's shop, at Nantymoel, near Bridgend, for the Co-operative Society. Plans and specifications may be seen at the Co-operative Stores, where forms of tender and bills of quantities can be obtained, upon a deposit of 1*l.* 1s. Sealed and endorsed tenders to be sent to the Secretary, Mr. John Morgan, Co-orperative Society, Nantymoel, not later than July 26. Mr. J. Morris Williams, architect and surveyor, Blackmill, near Bridgend.

✱ JULY 27.—**Greenwich.**—LIBRARY.—The Greenwich Borough Council invite tenders for a branch library in London-street, West Greenwich, according to drawings, specification, and conditions of contract and bond, which may be seen at Messrs. Wills & Anderson, architects, 24, Bloomsbury-square, W.C., between 10 and 12, on July 18, 19, and 20. Bills of quantities may be obtained of the Town Clerk, Town Hal, Greenwich, on payment of 2*l.* 2s. Tenders, on form supplied, sealed and endorsed "Tender for Branch Library," must be delivered to Town Clerk before 12 noon, July 27.

JULY 28.—**St. Anne's-on-the-Sea.**—SCHOOL.—St. Annes-on-the-Sea U.D.C. invite tenders for the erection of a new technical school, at St. Annes-on-the-Sea. Plans may be seen, and bills of quantities obtained, from the office of the County Architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston, by payment of a deposit of 2*l.* Sealed tenders, endorsed "Technical School," must be sent so as to reach Mr. Thomas Bradley, Clerk, Public Offices, St. Annes-on-the-Sea, not later than 12 o'clock noon on July 28.

JULY 30.—**Glasgow.**—LAUNDRY.—The Directors of the Caledonian Railway Company invite tenders for the works to be executed in the construction of a sponge cloth laundry, at St. Rollox Stores. The drawings may be seen at the office of the Company's Engineer, Buchanan-street Station, Glasgow, where copies of the specification and schedule may be obtained on payment of 2*l.* 2s. Sealed tenders, endorsed "Tender for Construction of Sponge Cloth Laundry at St. Rollox," to be lodged with Mr. J. Blackburn, Secretary, Caledonian Railway Company's Offices, 302, Buchanan-street, Glasgow, on or before July 30.

✱ JULY 31.—**Derby.**—POST OFFICE.—Tenders are invited for the enlargement of branch post office at Medland-road, Derby, for H.M. Office of Works. Drawings, specifications, conditions, and form of contract may be seen on application at the post office between 10 a.m. and 4 p.m. Bills of quantities may be obtained at H.M. Office of Works, Storey's-gate, S.W., on deposit of 1*l.* 1s. Tenders must be delivered to the Secretary, as above, endorsed "Tender for Derby Branch Post Office Enlargement," not later than 12 o'clock noon, July 31.

No DATE.—**Guildford.**—STEPS.—The Trustees of Poyle Charity Estate, Guildford, invite tenders for the construction of a flight of steps in Harvey-road, Guildford. The drawing and specification of works can be seen at office of Mr. William G. Lower, Surveyor to the Trustees, 12A, High-street, Guildford.

No DATE.—**Hebburn.**—HOUSE.—For building caretaker's house on St. John's Church grounds at Hebburn-on-Tyne. Plans and specification can be seen at St. John's Vicarage between 10 a.m. and 6 p.m.

No DATE.—**Magherahamlet.**—RESIDENCE.—For building at eacher's residence at Magherahamlet, Ballynahinch. Plans and specifications can be seen, and full particulars given, by Rev. Wm. Carse, Magherahamlet.

No DATE.—**Newcastle.**—PAROCHIAL BUILDINGS.—St. Jude's, new parochial buildings, Mr. A. B. Plummer, F.R.I.B.A., M.R.San.I., Diocesan Architect, 13, Grey-street, Newcastle-on-Tyne, and at Tynemouth.

No DATE.—**Saxton.**—FARMHOUSE.—The erection of a small farmhouse at Saxton, near Church Fenton. For particulars apply Mr. L. James, Estate Office, Womersley, Pontefract, where plans and specifications can be seen.

ENGINEERING, IRON, AND STEEL.

JULY 16.—**Belfast.**—BRIDGE.—Belfast Improvement Committee invite tenders for the supply and erection of a steel lattice girder bridge, 51 ft. span and 15 ft. wide. Drawings, specifications, and particulars may be obtained from the City Surveyor on payment of 1*l.* 1s. Sealed tenders, endorsed "Tender for Bridge," to be lodged in office of Mr. Samuel Black, Town Clerk, not later than July 16.

JULY 16.—**Warrington.**—WEIGHING MACHINE.—Warrington Markets Committee invite tenders for a 20-ton weighing machine. Any further information may be obtained at the office of the Borough Surveyor, Town Hall, at which place tenders must be delivered before 12 o'clock on July 16.

JULY 17.—**Great Yarmouth.**—TANKS.—Great Yarmouth Board of Guardians invite tenders for the following:—One cast-iron tank, 18 ft. 6 in. by 13 ft. 6 in. by 5 ft. deep; one cast-iron tank, 18 ft. by 10 ft. by 5 ft. deep; rolled steel joist framing for supporting same, erected complete at the Great Yarmouth Workhouse. Specifications and all particulars to be obtained on application to Mr. W. J. Carpenter, A.M.I.C.E., South Denes-road, Great Yarmouth, on deposit of a cheque for 1*l.* 1s. Tender, endorsed, to be addressed to "The Clerk, Great Yarmouth Board of Guardians, Queen-street, Great Yarmouth," and must be received by him through the post on or before noon on July 17.

JULY 18.—**Coychurch, etc.**—BRIDGES.—Glamorgan C.C. invite tenders for (1) improvement of Coychurch Bridge; (2) widening Coedgwilym Bridge, over the Swansea Canal, on the Swansea and Pontardawe main road, near Clydach. Plans and specifications of the respective works may be seen, and copies of the bills of quantities obtained, at the following places:—Work No. 1, the County Surveyor's Office, Town Hall, Bridgend; work No. 2, Clydach Police-station; and for both works at offices of Mr. T. Mansel Franklen, Clerk of the C.C., Glamorgan C.C. Offices, Westgate-street, Cardiff. Sealed tenders, made out on the bills of quantities supplied, are to be delivered to Clerk, together with the full names and addresses of two substantial sureties, not later than July 18.

JULY 19.—**Hull.**—RESERVOIR.—Hull Corporation have decided to invite amended tenders for the construction of a covered concrete service reservoir at Keldgate to hold about 10 million gallons. Drawings may be seen, and copy of specification and form of tender may be obtained, at the office of Mr. F. J. Bancroft, City Water and Gas Engineer, Alfred Gelder-street, Hull, on payment of 2*l.* Cheques and postal orders to be made payable to Mr. T. G. Milner, City Treasurer, Hull. Tenders, endorsed "Tender for Covered Service Reservoir," are to be addressed to the Chairman of the Water and Gas Committee, and delivered at the Town Clerk's Office not later than July 19.

JULY 20.—**Hartley Wintney.**—WATER SUPPLY.—The Hartley Wintney R.D.C. invite tenders for providing and laying about 2,800 yds. of 6-in. cast-iron main, together with the provision of a 10 h.p. oil engine, 6-in. rising main, and three-throw pump. The drawings, specifications, etc., may be seen at the office of Mr. F. L. Wetherall, Clerk to the Parish Council of Hartley Wintney, from 10 to 4 o'clock each day, except Saturday. Copies of specifications, quantities, and form of tender may be obtained from the engineers, Messrs. Belshaw & Co., 53, Victoria-street, London, S.W., on deposit of 3*l.* 3s. Sealed tenders, endorsed "Hartley Wintney Water Tender," must reach Mr. W. H. Wright, Clerk to the Council, Odiham, Hants, not later than 9 o'clock a.m. on July 20.

JULY 20.—**Porth.**—CONDENSER, ETC.—Rhondda U.D.C. invite tenders for the supply and erection of a condenser, washer, scrubber, and two purifiers at the Porth Gasworks. The drawings and specifications may be seen, and forms of tender supplied upon application to Mr. Octavius Thomas, Engineer and Manager, Gas and Water Offices, Pentre, Rhondda, upon depositing the sum of 1*l.* 1s. Tenders to be addressed to the Chairman of the Gas and Water Company, endorsed "Contract No. 37, etc.," and delivered at office of Mr. Walter, P. Nicholas, Clerk to the Council, Council Offices, Pentre, on or before 10 a.m. on July 20.

JULY 23.—**London.**—ELECTRIC-LIGHT INSTALLATION.—Stepney Borough Council invite tenders for laying on an electric light wiring installation at the two underground conveniences, Sutton-street, St. George-in-the-East. Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. The drawings may be seen, and copies of the stipulations, specifications, schedule, and form of tender may be obtained by applying to the Borough Engineer (Mr. M. W. Jameson, A.M.I.C.E.), at No. 15, Great Alie-street, Whitechapel, E., between the hours of 10 a.m. and 12 noon, upon paying 1*l.* (one pound) deposit. Tenders, endorsed "Tender for Electric Light Installation, Underground Conveniences, Sutton-street," should be sent to Mr. Geo. W. Clarke, Town Clerk, 15, Great Alie-street, Whitechapel, E., in the envelope supplied, so as to arrive on or before 12 o'clock noon on July 23.

✱ JULY 24.—**Ealing.**—REBUILDING BRIDGE.—Tenders are invited for rebuilding Perivale Bridge, Greenford-road. Drawings and specifications may be seen, and forms of tender, bills of quantities, and other particulars may be obtained, from the Borough Engineer, Town Hall, Ealing, W., during office hours, on deposit of 2*l.* 2s. Tenders, endorsed "Tender for Rebuilding Perivale Bridge," to be delivered to the Town Clerk, Town Hall, Ealing, not later than 9.30 a.m., July 24.

JULY 24.—**Henfield.**—WATER SUPPLY.—Steyning West R.D.C. invite tenders for the provision, laying, and jointing of about 1,250 yds. of 4-in. cast-iron pipes, together with all special castings and valves required for Henfield water supply. Plans may be seen, and specification and form of tender obtained, at the office of the engineer (Mr. Frederick Slaughter, High-street, Steyning). Tenders are to be received by Mr. Edward Cripps, Clerk to the R.D.C., Council Offices, Ham-road, New Shoreham, Sussex, not later than 9 a.m. on July 24.

✱ JULY 25.—**Dartford (Kent).**—ALTERATIONS.—The Metropolitan Asylums Board invite tenders for engineering alterations to laundries at Darenth Asylum, Dartford, Kent, in accordance with drawings and specification prepared by Mr. W. T. Hatch, Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender may be inspected at the Office of the Board, Embankment, E.C., on and after July 13, and can then be obtained on payment of 2*l.* Tenders, addressed as noted on the form, must be delivered at the Office of the Board, before 10 a.m., July 25.

JULY 25.—**London.**—CARRIAGES.—The East Indian Railway Company invite tenders for the supply and delivery of bogie carriages, as per specification to be seen at the company's offices. Tenders are

to be sent to Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C., marked "Tender for Bogie Carriages," not later than 12 o'clock noon on July 25. For each specification a fee of 1*l.* 1*s.* is charged, which cannot, under any circumstances, be returned.

JULY 25.—**Rainhill.**—PLANT.—The Committee of Visitors of the County Asylum, Rainhill, invite tenders for the manufacture, supply, delivery, and erection complete at their electricity and pumping station of the undermentioned plant:—(*a*) One independent surface condensing plant with electrically driven pumps, together with the necessary pipework; (*b*) one water softening and purification plant. Plans and works may be seen, and condition, specification, and form of tender may be obtained, from the Engineer's Office at the Institution. Tenders to reach Mr. Jas. Gornall, Clerk and Steward, Clerk's Office, County Asylum, Rainhill, not later than 5 p.m. on July 25, endorsed on the outside "Water Softening."

JULY 26.—**Aberdeen.**—STEELWORK.—The Aberdeen Harbour Commissioners invite tenders for the delivery and erection of about 550 tons of built steelwork for a two-story goods shed, to be erected at Regent Quay. The drawings may be seen, and copies of the specifications and schedules of quantities obtained, between 10 a.m. and 4 p.m. at the office of Mr. R. Gordon Nicol, Harbour Engineer, Harbour Engineer's Office, Aberdeen, on payment of 2*l.* 2*s.* Tenders are to be lodged not later than 12 o'clock noon on July 26.

JULY 30.—**Stanley and West Hallam.**—PIPES.—Shardlow R.D.C. invite tenders for the supply and free delivery at West Hallam, Derbyshire, of cast-iron pipes, special castings, etc., in connexion with the water supply of Stanley and West Hallam, near Ilkeston. The contract will comprise of about 186 tons of 6-in. pipes, 76 tons of 4-in. pipes, and 35 tons of 3-in. pipes. Full particulars, with specification, bills of quantities, and form of tender, may be obtained from the engineers, Messrs. Elliott & Brown, Burton Buildings, Parliament-street, Nottingham, on deposit of 2*l.* 2*s.* Sealed tenders, addressed to Mr. J. W. Newbold, Clerk to the Council, Council Offices, Derby, and endorsed "Tenders for Iron Pipes," to be delivered on or before the first post on July 30.

JULY 30.—**Stanley and West Hallam.**—WATERWORKS.—Shardlow R.D.C. invite tenders from responsible contractors for the construction of waterworks at Stanley and West Hallam, Derbyshire, including laying 4,466 yds. of 6-in., 3,050 yds. of 4-in., and 1,910 yds. of 3-in. cast-iron pipes, with all appurtenances, and the construction of a brick service reservoir (capacity, 90,000 gallons). Plans may be seen, and specification and bills of quantities obtained, at the offices of the Engineers, Messrs. Elliott & Brown, Burton Buildings, Parliament-street, Nottingham, on deposit of 2*l.* 2*s.* Sealed tenders, addressed to Mr. J. W. Newbold, Clerk to the Council, Council Offices, Derby, and endorsed "Tender for Waterworks," to be delivered on or before the first post on July 30.

JULY 31.—**Bangor.**—PLANT.—The U.D.C. of Bangor, Co. Down, invite tenders for the supply and erecting complete of a sulphate of ammonia plant. Full particulars can be had at the gasworks from the Manager, Mr. B. Mitchell. Sealed tenders, endorsed "Sulphate Plant," must be delivered at office of Mr. James Milliken, Town Clerk, Town Hall, Bangor, Co. Down, not later than 12 o'clock noon on July 31.

* SEPTEMBER 4.—**Lancaster.**—RECONSTRUCTION OF STEAM HEATING AND HOT-WATER SERVICE.—The date for receiving tenders for above work at County Lunatic Asylum, Lancaster, has been extended to September 4.

MISCELLANEOUS.

JULY 16.—**Shotton.**—STREET LIGHTING.—Shotton Parish Council invite tenders for street lighting (Acetylene) at Shotton Colliery. Particulars may be had at the Clerk's residence, 20, Milbank-terrace, Station Town, Wingate, until July 16.

JULY 17.—**Cardiff.**—RENOVATION AND REMOVAL OF PAINTINGS.—Cardiff Corporation invite tenders from local firms for the removal of certain oil-paintings from the old to the new Town Hall, and the renovation, etc., of such pictures. A print of the conditions and specification may be obtained at office of Mr. J. L. Wheatley, Town Clerk. Sealed tenders (on the proper forms), endorsed "Pictures," to be delivered to him on or before July 17.

JULY 19.—**Dublin.**—MACHINERY OILS.—The Corporation of Dublin invite tenders for (approximately) a twelvemonth's supply of machinery oils for the Corporation Electricity Works, Pigeon House Fort, Dublin. Copies of the specification, price 1*s.*, can be obtained from the Town Clerk, and tenders must reach his office not later than 12 o'clock noon on July 19, marked "Tender for Machinery Oils," and addressed to the Chairman, Supplies Committee, City Hall, Dublin.

JULY 19.—**Fursnewth.**—FILLING IN QUARRY.—Liskeard District Council invite tenders for partially filling in a quarry at Fursnewth, in the Parish of St. Cleer. The surveyor will be on the spot on Monday, July 16, from 11 to 4 o'clock, to point out the work proposed to be done, when conditions of letting may be seen. Tenders to be sent, addressed, postpaid, and marked "Tenders for Quarry," to the Clerk's Office, West-street, Liskeard, on or before July 19.

JULY 20.—**Ealing.**—OIL.—The Town Council of the Borough of Ealing invite tenders for the supply to their electricity works of best cylinder oil, crank-chamber oil, paraffin, engine oil, best rope waste, and stoneware pipes. Tender, forms, and full particulars can be obtained on application to Mr. Albert E. Lewis, A.C.I.S., Business Manager, Electricity Department, Town Hall, Ealing, and must be delivered not later than noon, July 20.

JULY 20.—**Hull.**—COLLECTION OF NIGHTSOIL.—Hull Corporation invite tenders for the collection of nightsoil only (not dry dust), in districts Nos. 5 (Old Town), 10, 11, 12, 13, 14, 18, and 19, for a period of one year from October 1 next. Plans of the districts and specifications may be seen, and forms of tender obtained, on application to the Inspector of Nuisances, at his office, in Hanover-square. Tenders, endorsed "Tender for Collection of Nightsoil," to be delivered at office of Mr. E. Laverack, Town Clerk, Town Hall, Hull, on or before noon on July 20.

* JULY 23.—**Cleveland-street, W.**—SICK ASYLUM.—Tenders are invited for repairs to the gutters, parapets, etc., at the Asylum in Cleveland-street, W., for the Managers, Central London Sick Asylum District. Specifications may be seen by appointment, and bills of quantities obtained at the architect's office, Mr. William Lockwood, 12, Sherwood-street, W., on payment of 2*l.* 2*s.* Tenders, addressed to the Board of Management, will be received at the Clerk's office, Cleveland-street Asylum, not later than 10 a.m., July 23.

JULY 23.—**Leeds.**—GAS OIL.—Leeds Corporation Gas Committee invite tenders for the supply of 2,000 tons of gas oil for the manufacture of carburetted water gas, for a period of one year, commencing on September 1 next. Specification and conditions of tender may be obtained on application to Mr. R. H. Townsley, General Manager, Gas Offices, East Parade, Leeds. Tenders and samples, addressed to the Town Clerk, and endorsed "Gas Oil," must be delivered at the Town Hall, Leeds, on or before July 23.

JULY 25.—**Ticehurst.**—ROAD ROLLING.—Ticehurst R.D.C. invite tenders for steam rolling in their district as from the first week in November, 1906. The contractors will be required to supply one or more rollers with driver and mate to each, scarifiers, sleeping-vans, water-carts, with horse and man to each, and all necessary appliances. The work to be undertaken either by the piece or by daywork, as the Council may determine. Forms of tender may be obtained from Mr. W. N. Wood, surveyor, Ticehurst, on a stamped addressed foolscap envelope being forwarded. Tenders, sealed and endorsed "Steam Rolling," must be sent so as to reach Mr. J. C. Lane Andrews, Clerk to the Council, Wadhurst, Sussex, not later than July 25.

JULY 25.—**Wanstead.**—STEAM ROLLER.—Wanstead U.D.C. invite tenders for the supply of a 10-ton steam roller, with driver, attendant, fuel, etc., to work in the district during the months of September, October, November, and December, 1906. Forms of tender, with further particulars, can be obtained on application to the Surveyor, at the Council Offices. Tenders, sealed and enclosed in the envelopes provided, are to be delivered at the Council Offices not later than July 25.

JULY 26.—**Roxburgh.**—FURNITURE.—The Roxburgh District Board of Lunacy invite tenders for the furniture and furnishings required for the new female wing of the asylum. Samples may be inspected at the asylum, and schedules of quantities and forms of tender may be had on application to the House Steward. Tenders must be lodged with the Medical Superintendent not later than July 26.

JULY 28.—**Chard.**—ROLLING.—Chard (Somerset) R.D.C. invite tenders for rolling the stones to be laid on main and district roads during the ensuing season. The contractor to provide two 15-ton steam rollers fitted with Henderson's patent detachable scarifiers, and two 10-ton steam rollers, to commence work early in September. Additional rollers to be provided if required. Inclusive charges at per day and at per cubic yard rolled to be named, for the selection of the Council. Further information and forms of tender may be obtained from Mr. R. Stephens, District Surveyor, Ilminster, or Mr. F. Gordon Ross, Clerk, R.D.C. Office, Chard. Tenders, endorsed "Steam Rolling Tender," to be sent before July 28 to the Clerk.

NO DATE.—**Clevedon.**—ROOFING.—The Vicar and Churchwardens of St. John the Evangelist's Church invite tenders for new tile roofing. For particulars apply to Mr. Henry Taylor, C.E., M.S.A., Clevedon, at once.

PAINTING, etc.

JULY 16.—**Cardiff.**—PAINTING, ETC.—Cardiff Education Committee invite tenders for painting, colouring, etc., the inside and outside of the Wood-street Council School. Specifications of the work may be obtained at the Education Offices, Howard-gardens, Cardiff. Tenders, sealed, and endorsed "Tender for Painting Wood-street Council School," must reach Mr. John J. Jackson, Director of Education, Education Offices, Howard-gardens, on or before July 16.

JULY 16.—**Warrington.**—PAINTING.—Warrington Cemetery Committee invite tenders for the painting of the cemetery chapels, etc. Specifications and all further information may be obtained at the office of the Borough Surveyor, Town Hall, at which place tenders must be delivered before 12 o'clock on July 16.

JULY 17.—**Bath.**—PAINTING.—For painting and decorating work at the Grand Pump Room and Baths for the Hot Mineral Baths Committee. Particulars, copy of specification, and form of tender from Mr. Alfred J. Taylor, architect, 18, New Bond-street, Bath. Tenders to be on forms and in endorsed envelopes, which will be provided, addressed to the Chairman of the Hot Mineral Baths Committee, Town Clerk's Office, Guildhall, and sent in not later than 10 a.m., July 17.

JULY 17.—**Manchester.**—PAINTING.—Manchester Sanitary Committee invite tenders for painting Walton House, Harrison-street (interior). Specification may be obtained at the office of the City Architect, Town Hall, upon payment of 1*l.* 1*s.* Sealed tenders, enclosed in the official envelope, to be delivered at the above office not later than 9 a.m., July 17.

JULY 17.—**Manchester.**—PAINTING.—Manchester Town Hall Committee invite tenders for painting new Islington Public Hall (interior). Specification may be obtained at the City Architect's Office, Town Hall, upon payment of 1*l.* 1*s.* Sealed tenders, enclosed in the official envelope, to be delivered at the above office not later than 9 a.m. on July 17.

JULY 17.—**Stockport.**—PAINTING.—Stockport Parks Committee invite tenders for painting (labour and materials) the whole of the wood and iron work at Hollywood Park, and Heaton Norris Recreation Ground. Specifications and conditions and forms of tender may be obtained on application to Mr. John Atkinson, A.M.Inst.C.E., Borough Surveyor, Borough Surveyor's Office, Stockport. Tenders, addressed "The Borough Surveyor, Stockport," sealed and endorsed "Tender for Painting at Parks," to be left at his office at or before noon on July 17.

JULY 18.—**Bagthorpe.**—PAINTING.—Nottingham Health Committee invite tenders for cleaning and painting at the Bagthorpe Hospital. Specifications, forms of tender, and bills of quantities may be obtained from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 1*l.* 1*s.* Sealed tenders to be delivered to Mr. Samuel G. Johnson, Town Clerk, Guildhall, Nottingham, at or before 10 a.m. on July 18.

JULY 18.—**Leeds.**—PAINTING, ETC.—Leeds Education Committee invite tenders for painting and cleaning of schools during the mid-summer vacation. Specifications and full particulars of the work on application to the Architect's Department, Education Offices, or to Mr. W. Packer, Secretary, Education Offices, Leeds, to whom sealed and endorsed tenders must be sent not later than 12 o'clock noon on July 18.

JULY 18.—**Stockton-on-Tees.**—WASHING AND DISTEMPERING.—Stockton-on-Tees Education Committee invite tenders for the washing and distempering to be done during the mid-summer holidays at the Higher Grade Schools. Specification may be seen and other particulars obtained at the Borough Engineer's Office, Town Hall. Tenders to be sent to Mr. M. H. Sykes, Borough Engineer, Town Hall, Stockton-on-Tees, before 10 a.m. on July 18.

JULY 19.—**Haverstock Hill.**—PAINTING, ETC.—Hampstead Borough Council invite tenders for exterior painting and repointing of chimney stacks, etc., at the Town Hall, Haverstock Hill. Forms of tender can be obtained, and specification inspected, at the office of Mr. O. E. Winter, A.M.I.C.E., Borough Engineer. Tenders, endorsed "Painting, etc.," must be delivered to Mr. Arthur P. Johnson, Town Clerk, Town Hall, Haverstock Hill, not later than 4 p.m. on July 19.

JULY 19.—**Huddersfield.**—PAINTING.—The Corporation of Huddersfield invite tenders for the painting and decorating of the Huddersfield Technical College. Specifications and general conditions may be seen, and bills of quantities and forms of tender obtained, on application at the Offices of the Borough Engineer and Surveyor, 1, Peel-street. Sealed tenders, endorsed "Tender for Painting Technical College," signed in the handwriting of the tenderer or his agent, and addressed "Town Clerk, Town Hall, Huddersfield," must reach him not later than 10 a.m. on July 19.

JULY 20.—**Chartham Downs.**—PAINTING.—Works of painting, repairs, etc., and other works in connexion to Section No. 3 of Kent County Asylum, Chartham Downs, near Canterbury. The specifications can be seen at the office of Mr. W. J. Jennings, architect, 4, St. Margaret's-street, Canterbury, and copies of the bills of quantities obtained therefrom, on depositing with him the sum of 5*l.* Tenders to be delivered to the Asylum, addressed to the Chairman of the Committee of Visitors, not later than 10 o'clock on the morning of July 20.

JULY 20.—**Kingswood.**—GAS SERVICE, ETC.—The Managing Body of Cossham Hospital, Kingswood, invite estimates for the installation of gas service and fittings. Specifications may be had of the architect, Mr. F. Bligh Bond, F.R.I.B.A., of Star Life Buildings, St. Augustine's Parade, Bristol, on application at his office. Tenders, sealed and endorsed "Tender for Gas to Hospital," to be delivered to the architect not later than noon on July 20.

JULY 21.—**Derby.**—PAINTING.—Derby Education Committee invite tenders for painting and colouring at various Council and voluntary schools during the summer holidays. Tenders must be delivered not later than 10 o'clock a.m. on July 21. Specifications can be obtained from Mr. William Cooper, Secretary to the Derby Education Committee, Education Offices, Becket-street, Derby.

JULY 21.—**Glentham.**—PAINTING.—Lindsey (Lincolnshire) Education Committee invite tenders for painting, varnishing, and colour-washing, etc., of Glentham Council School. Tenders to be sent to Mr. Wm. Good, Glentham, Lincoln, by July 21.

JULY 23.—**Bramley.**—PAINTING, ETC.—Bramley Guardians invite tenders for painting and renovating the Board Offices, at 1, Green Hill-road, Armley. Specification may be seen at the Clerk's Office on application. Tenders must reach Mr. A. Gaunt, Clerk to the Guardians, Union Offices, Armley, not later than 12 o'clock noon on July 23.

JULY 23.—**Huddersfield.**—PAINTING.—Huddersfield Education Committee invite tenders for painting and other work at various schools. General specification and conditions may be seen, and forms of tender, and short specification for each school, obtained on application at the offices of Mr. K. E. Campbell, M.Inst.C.E., Borough Engineer, on and after July 16. Sealed tenders, endorsed "Tender for Painting Moldgreen School," or as the case may be, signed in the handwriting of the tenderer or his agent, and addressed "Town Clerk, Town Hall, Huddersfield," must reach him not later than 10 a.m. on July 23.

JULY 23.—**Whittingham, Preston.**—PAINTING.—Tenders are invited for labour and plant only, and a separate one for the materials (paints, oils, varnishes, etc.), for outside painting at County Asylum, Whittingham, Preston. Specifications, with forms of tender, may be obtained from Mr. Thomas Dilworth, Clerk and Steward, at the Asylum. Tenders to be in on or before July 23, at 10 o'clock in the morning.

JULY 24.—**Birkenhead.**—PAINTING.—The Corporation of Birkenhead invite tenders for painting the Woodside Ferry Buildings and Approaches. Further information, specifications, and forms of tender may be obtained on application at the office of the Ferries Manager, Woodside Ferry, Birkenhead. Tenders (which must be on the printed form supplied), sealed and endorsed "Tender for Painting Ferry Buildings," must be sent in to Mr. Alfred Gill, Town Clerk, Town Hall, Birkenhead, not later than 5 o'clock in the afternoon of July 24.

JULY 24.—**Maidstone, etc.**—PAINTING, ETC.—For painting and repairs at Maidstone and Canterbury Sessions Houses, and Elham, New Brompton, Sandwich, Seabrook, and Sheerness Police-stations, for the Standing Joint Committee. Bill of quantities and tender form for each or either of them, at the office of the County Architect, 86, Week-street,

Maidstone. The specification of the work can be inspected at the buildings daily, 10 to 5. Tenders not on the form provided will not be considered. Sealed tenders, endorsed "Painting, etc.," are to be delivered at the Sessions House, Maidstone, addressed to Mr. Charles Turner, Clerk, Sessions House, Maidstone, not later than 10 o'clock July 24.

* JULY 25.—**Dartford (Kent).**—PAINTING, ETC.—The Metropolitan Asylums Board invite tenders for cleaning and painting works at Joyce Green Small-pox Hospital, Dartford, Kent, in accordance with specification prepared by Mr. W. T. Hatch, Engineer-in-Chief. Specification, conditions of contract, and form of tender may be inspected at the Office of the Board, Embankment, E.C., on and after July 16, and can then be obtained on payment of 1*l*. Tenders, addressed as noted on the form, must be delivered at the Office of the Board, before 10 a.m., July 25.

* JULY 25.—**Edmonton.**—PAINTING.—The Guardians of the Edmonton Union invite tenders for painting certain portions of the outside of their Workhouse at Edmonton. Specifications and forms of tender can be obtained at the office of the architect, Mr. Stuart Hill, 106, Cannon-street, E.C., on payment of 1*l*. 1s. Tenders, endorsed "Tender for Outside Painting," to be delivered to Mr. F. Shelton, Clerk, Lower Edmonton, before 9 a.m., July 25.

NO DATE.—**Holborn.**—PAINTING.—Holborn Guardians invite tenders for certain painting works at their offices, No. 53, Clerkenwell-road, E.C. Copy of the specifications and form of tender may be obtained from the undersigned, Mr. J. Allan Battersby, Clerk to the Guardians, Clerkenwell-road.

* NO DATE.—**Mile End, E.**—WHITEWASHING, PAINTING, ETC.—Tenders are invited for whitewashing, painting, etc., at the Workhouse, Bancroft-road, E. Forms of tender and full particulars can be had upon application at the architect's office, Mr. J. M. Knight, 35, Bancroft-road, Mile End, E.

NO DATE.—**Ynysboeth.**—PAINTING.—For painting 100 houses at Ynysboeth, near Abercynon, Glamorganshire. Specifications may be obtained from Messrs. E. T. Davies & Co., auctioneers, Victoria-chambers, Pentre.

ROADS, SANITARY, AND WATER WORKS.

JULY 16.—**Hereford.**—ROADS.—For forming new roads in the Portfields, Hereford, for the Hereford Industrial Aid Society. Tenders must be received on or before July 16, 1906. For plans and specifications apply Mr. W. G. C. Britten, surveyor, Hereford.

JULY 16.—**Ilford.**—REPAIRING TAR-PAVING.—Ilford U.D.C. Education Committee invite tenders for top-dressing and repairing the tar-paving of playgrounds at the Christchurch-road and Downshall schools, Ilford, during the summer vacation. Copies of specification and form of tender can be obtained of the Architect, Mr. C. J. Dawson, F.R.I.B.A., 11, Cranbrook-road, Ilford, upon depositing 1*l*. 1s. Tenders, on the proper forms supplied, together with the specification enclosed therewith, to be in sealed envelopes endorsed on outside, "Tender for Repairing Tar-paving," and delivered to Mr. W. S. Torbitt, M.A., Secretary, Education Offices, Cleveland-road, Ilford, not later than 12 noon on July 16.

JULY 17.—**Bishopthorpe.**—ASPHALTING.—West Riding C.C. Education Department (Bishopthorpe District Sub-Committee) invite tenders for the asphalting of the playgrounds (two) at Copmanthorpe Provided school. Sealed tenders to be delivered to Mr. Benj. Sheard, Divisional Clerk, Education Offices, Selby, from whom specifications may be obtained, not later than July 17.

JULY 17.—**Blackrock.**—SEWER.—The U.D.C. of Blackrock invite tenders for the reconstruction of about 50 yds. of 6-in. sewer, with 4-in. branches, etc., in accordance with the plans and specifications to be seen at office of Mr. R. Finlay Heron, Town Clerk, Town Hall, Blackrock, Co. Dublin. Tenders, endorsed "Tenders for Sewer," to be lodged with the Town Clerk on or before 5 o'clock p.m. on July 17.

JULY 17.—**Halifax.**—PUBLIC IMPROVEMENTS.—Halifax Improvement Committee invite tenders for the execution of public improvement works in Spring Hall-lane, near Clay Pits. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax, upon payment of the sum of 1*l*. Tenders, endorsed "Spring Hall-lane Improvement," must be sent to Mr. Keighley Walton, Town Clerk, not later than 10 o'clock a.m. on July 17.

JULY 17.—**King's Heath.**—ROAD.—King's Norton and Northfield U.D.C. invite tenders for the making good of Woodville-road, King's Heath. Specifications, bill of quantities, and form of tender may be obtained from the Engineer and Surveyor to the Council, Mr. Ambrose W. Cross, A.M.Inst.C.E., of 23, Valentine-road, King's Heath, on payment of a deposit of 2*l*. 2s. Plans may also be seen at the said offices, 23, Valentine-road, King's Heath. Sealed tenders, endorsed "Tender for Making Good Woodville-road," must be sent to Mr. Edwin Docker, Clerk to the Council, Newhall-street, Birmingham, not later than 12 o'clock noon on July 17.

JULY 17.—**Leeds.**—PAVING.—Leeds Highways Committee invite tenders for the paving and flagging of the following streets:—Harold-grove, Back Harold-grove, Raincliffe-grove, Temple View-terrace, Raincliffe-street, Chantrell-place, Everleigh-street, Everleigh-place, Evenleigh-grove, and Chantrell-grove. Drawings may be seen at the City Engineer's office, Municipal-buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall-road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on July 17.

JULY 18.—**Glamorganshire.**—WIDENING ROADS, ETC.—The Glamorgan C.C. invite tenders for the following works:—(1) Widening of Cowbridge and Llantrisant main road north and south of Aberthin; (2) Widening Aberavon and Baglan main road near Pentwyn Farm; (3) Widening the Neath and Llansamlet main road at Skewen; (4) improvement of Coychurch Bridge; (5) widening Coedgwilym Bridge, over the Swansea Canal, on the Swansea and Pontardawe main road, near Clydach. Plans and specifications of the respective works may be seen, and copies of the bills of quantities obtained, at the following places:—Work No. 1, Cowbridge Police-station; work No. 2, Port Talbot Police-station: work No. 3, Skewen Police-station: work No. 4, the County Surveyor's Office, Town Hall, Bridgend; work No. 5, Clydach Police-station; and for all the works at offices of Mr. T. Mansel Franklen, Clerk of the C.C., Glamorgan C.C. Offices, Westgate-street, Cardiff. Sealed tenders, made out on the bills of quantities supplied, are to be delivered to the Clerk, together with the full names and addresses of two substantial sureties, not later than July 18, marked outside, "Tender for Cowbridge and Llantrisant Road Widening," "Tender for Aberavon and Baglan Road Widening," etc., as the case may be.

JULY 18.—**Inverseshie.**—RIVER EMBANKMENT.—For construction of about 140 lin. yds. of river embankment at Inverseshie. Drawings and specification may be seen with Mr. James Fraser, C.E., Inverness, and Mr. Alex. Munro, Estate Overseer, Inverseshie Mr. Munro will point out the ground, and offers are to be lodged with Mr. Fraser by July 18.

JULY 18.—**Rathdown.**—SEWAGE WORKS.—The Rathdown No. 1 R.D.C. invite tenders for the construction of sewage purification works for the Foxrock District, together with other works appertaining thereto, in accordance with plans and specification furnished by Mr. P. F. Comber, M.Inst.C.E., and Mr. J. Pansing, A.M.Inst.C.E.I., which can be seen at office of Mr. Patrick Cunniam, Clerk of the Council, Clerk's Office, Loughlinstown, between the hours of 11 a.m. and 3 p.m. daily (Saturdays excepted). A copy of the specification, quantities, and form of tender will be supplied to each competitor on depositing 3*l*. sterling. Tenders to be addressed to the Clerk, endorsed "Tender for Sewage Purification Works," and delivered at the Board-room before 11 o'clock a.m. on July 18.

JULY 19.—**Edinburgh.**—PAVING.—Edinburgh Corporation invite tenders for Whinstone paving in the carriageways of:—(1) Appin-terrace; (2) Roseburn-place; and (3) lane at 5, East Preston-street. Also for concrete paving in carriageways of (4) Springvalley-terrace; and (5) Gibson-street. Also for granolithic footways at (6) Aboretum-road and Kinnear-road. Plans may be seen, and schedules of quantities and specifications obtained, on application to the City Road Surveyor, City Chambers. Tenders, sealed within the official envelopes supplied, must be lodged with Mr. Thomas Hunter, W.S., Town Clerk, City Chambers, by 10 a.m. on July 19.

JULY 19.—**Stockport.**—SEWERING.—Stockport Highways and Sewers Committee invite tenders for the manual and team labour and materials required in sewering the following streets within the borough, namely:—Longford-road, Lewis-road, Welland-street, Denstone-road, Tyrrell-road. Plans, sections, specifications, and conditions may be seen, and forms of tender obtained, on application to Mr. John Atkinson, A.M.Inst.C.E. Borough Surveyor, Borough Surveyor's Office, Stockport. Tenders, addressed "The Borough Surveyor, Stockport," sealed, and endorsed "Tender for Sewering Longford-road, etc.," to be left at his office at or before noon on July 19.

JULY 21.—**Hindley.**—SEWER.—The U.D.C. of Hindley invite tenders for the construction of a 12-in. sewer, about 300 yds. long, in Strangeways-fields, Hindley, together with manholes, and other works incidental thereto. Form of tender, etc., from the Surveyor, Mr. Oswald P. Abbott, on payment of 1*l*. 1s. Sealed tenders, endorsed "Sewer," to be sent to Mr. Thomas Robey, Clerk, Council Offices, Hindley, not later than July 21.

JULY 21.—**Stockton Heath.**—SEWER.—The R.D.C. of Runcorn invite tenders for the construction of a new sewer in Grappenhall-road, Stockton Heath. The works will comprise stoneware pipe sewers, together with all manholes, lampholes, and other appurtenances. Drawings and specifications may be seen, and quantities, form of tender, and all other particulars obtained, on application at the offices of Messrs. Wright, Garnett, & Wright, architects, 45, Sankey-street, Warrington, on payment of a sum of 10s. 6d. Sealed tenders, endorsed "Tender for Grappenhall-road Sewer," to be sent in to Mr. Geo. F. Ashton, Clerk to the Council, 71, High-street, Runcorn, not later than July 21.

JULY 23.—**Cheshunt.**—ROAD WORKS.—Cheshunt U.D.C. invite tenders for the construction of a 40-ft. road about 600 ft. long, situated in the Manor House grounds, Cheshunt. The plan and specification can be seen, and forms of tender obtained, from Mr. Reginald H. Jeffes, Assoc.M.Inst.C.E., Engineer and Surveyor to the Council, Manor House, Cheshunt. Persons tendering must take off their own quantities. Sealed tenders, in envelopes supplied, and addressed Chairman, Cheshunt U.D.C., to be delivered at or before 4 p.m., July 23.

* JULY 24.—**Bromley.**—STREET IMPROVEMENTS.—The Bromley Borough Council invite tenders for certain works of sewering, levelling, paving, metalling, channelling, and making good certain streets in accordance with plans, sections, and specifications prepared by the Borough Engineer, which may be seen, and bills of quantities, etc., obtained, on payment of 10s. 6d. Tenders, endorsed "Tender for Works of Street Improvements," to be delivered to Mr. F. H. Norman, Town Clerk, Bromley, Kent, before 3, July 24.

JULY 24.—**Gateshead.**—PAVING.—Gateshead Corporation invite tenders for paving, etc., and tar-macadamising the following streets:—(1) Back Beaconsfield-crescent West, Low Fell; (2) Beaconsfield Crescent, Low Fell; (3) Cross Back-street, between Beaconsfield-crescent and Back Beaconsfield-crescent, Low Fell; (4) Back Dean-street (remainder of), Low Fell. Plans and specifications may be seen, and quantities obtained, at the office of Mr. N. P. Pattinson, Borough Engineer, Town Hall. Tenders are to be sent in, sealed, and endorsed "Tenders for Streets Making," on or before 2 p.m. on July 24.

JULY 24.—**Mountain Ash.**—STREET WORKS.—Mountain Ash U.D.C. invite tenders for the execution of private street works in the street running from Quarry-road, Penrhiwceiber, to Penrhiwceiber Quarry. Plans and specification may be seen, and form of tender and bill of quantities obtained, on application to Mr. W. G. Thomas, Surveyor, Town Hall, Mountain Ash. Sealed tenders, prepaid, and endorsed "Quarry-road, Penrhiwceiber," to be sent to Mr. H. P. Linton, Clerk to the Council, Town Hall, Mountain Ash, so that they be received not later than 9 a.m. on July 24.

JULY 24.—**Mountain Ash.**—STREET WORKS.—Mountain Ash U.D.C. invite tenders for the execution of private street works in Edward's street, Miskin. Plans and specification may be seen, and form of tender and bill of quantities obtained, on application to Mr. W. G. Thomas, Surveyor, Town Hall, Mountain Ash. Sealed tenders, prepaid, and endorsed "Edward's-street, Miskin," to be sent to Mr. H. P. Linton, Clerk to the Council, Town Hall, Mountain Ash, so that they be received not later than 9 a.m. on July 24.

* JULY 24.—**Willesden.**—ROAD-MAKING, ETC.—The Willesden District Council invite tenders for certain road-making and paving works. Plans and specifications may be seen, and all further particulars obtained, on and after July 16, upon application to Mr. O. Claude Robson, Council's Engineer, Public Offices, Dyne-road, Kilburn, N.W. Tenders, endorsed "Private Streets," to be delivered at the offices of the Council before 4 p.m., July 24. A 10*l*. note to be deposited with each tender.

JULY 25.—**Barrow.**—SURFACE-WATER SEWERS.—Barrow-in-Furness Corporation invite tenders for the construction of the following lengths of surface-water sewers, inclusive of all manholes, lampholes, gullies, and connexions and outfalls:—Sewer No. 1, 423 lin. yds. 3 ft. by 2 ft. egg-shaped brick sewers. Sewer No. 2, 687 lin. yds. 5 ft. 9 in. by 3 ft. 10 in. egg-shaped brick sewers; 120 lin. yds. 4 ft. 3 in. by 2 ft. 10 in. egg-shaped brick sewers; 338 lin. yds. 4 ft. by 2 ft. 8 in. egg-shaped brick sewers; 260 lin. yds. 3 ft. 3 in. by 2 ft. 2 in. egg-shaped brick sewers; 220 lin. yds. 3 ft. by 2 ft. egg-shaped brick sewers. Pipe sewers: 100 lin. yds. 21 in. stoneware pipe sewer; 40 lin. yds. 18 in. stoneware pipe sewer; 170 lin. yds. 15 in. stoneware pipe sewer; 120 lin. yds. 12 in. stoneware pipe sewer; 120 lin. yds. 9 in. stoneware pipe sewer. Also for certain works in filling up existing brick sewers. Plans and sections may be seen at the Borough Engineer's Office, and copies of specification and bills of quantities and forms of tender obtained on application to the Borough Treasurer, upon payment of the sum of 5*l*. Tenders and fully-priced bills of quantities, each in a separate, properly-sealed envelope, endorsed "Tender for Surface-water Sewers," must be delivered at the Town Clerk's office not later than 12 o'clock noon on July 25.

* JULY 25.—**Dartford (Kent).**—CESSPOOL AND DRAINAGE.—The Metropolitan Asylums Board invite tenders for building cesspool, and constructing new drainage for four cottages and gate-porter's lodge at Gore Farm Convalescent Hospital, Dartford, Kent, in accordance with drawings and specification prepared by Mr. W. T. Hatch, Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender may be inspected at the Office of the Board, Embankment, E.C., on and after July 16, and can then be obtained on payment of 1*l*. Tenders, addressed as noted on the form, must be delivered at the Office of the Board before 10 a.m., July 25.

* JULY 28.—**Paddington.**—WOOD PAVING.—Tenders are invited for renewal with 8 in. or 9 in. by 3 in. by 6 in. creosoted deal wood blocks of paving in Edgware-road (all materials and labour, about 3,650 super. yds.), (No. 25a); renewal with 9 in. by 3 in. by 4 in. West Australian hardwood blocks of paving in Praed-street (not more than 5,100 super. yds.), (No. 25c); purchase of old West Australian hardwood blocks taken from above (No. 51); construction of sewer, with manholes, lampholes, drain connexions, contingent work, and accessories in Queen's-gardens (No. 52). Conditions, specifications, schedule, and bills of quantities, and forms of tender obtainable, between 10 a.m. and 4 p.m. (Saturdays 10 a.m. and 1 p.m.), from the Borough Surveyor, Town Hall, Paddington, W. A deposit of 1*l*. is required in the case of contract No. 52. Tenders, endorsed in accordance with particulars of contract, and delivered at the Town Hall on or before July 28.

JULY 30.—**Middleton.**—SEWERS.—Chadderton U.D.C. invite tenders for the construction of earthenware and cast-iron pipe sewers, etc., for the sewerage of the Middleton Junction District. Drawings and specifications may be seen, and quantities, form of tender, and all other particulars obtained, on application at the offices of Messrs. James Diggle & Son, civil engineers, Hind Hill-street, Heywood, and 14, Victoria-street, Westminster, S.W., on payment of a sum of 3*l*. Tenders, endorsed "Tenders for Middleton Junction Sewerage, Contract No. 14," are to be sent to Mr. Henry Hoyle, Clerk to the Council, Town Hall, Chadderton, not later than July 30.

JULY 30.—**Tavistock.**—SEWERAGE WORKS.—Tavistock U.D.C. invite tenders for works of sewerage and sewage disposal, including the providing and laying of stoneware and cast-iron sewers, and the construction of sedimentation tanks, manholes, etc., at Tavistock. Drawings may be seen, and copies of the specification, bill of quantities, and form of tender obtained, at the office of the Engineer, Mr. John Chadwick, F.G.S., Bletchley, Bucks, upon payment of a deposit of 3*l*. 3s. Sealed tenders, on the prescribed form, endorsed "Tender for Sewage Works," must be received at office of Mr. W. W. Mathews, solicitor, Clerk to the Council, Council Offices, Tavistock, not later than 12 o'clock noon on July 30.

STONE, MATERIALS, AND STORES.

JULY 15.—**Dewsbury.**—MATERIALS.—Dewsbury Corporation invite tenders for supply of the following materials, etc., during the year ending August 31, 1907:—Broken granite, York stone kerbs and flags, manhole and lamphole tops, gully grates, fireclay pipes, bricks, etc., pitch and creosote oil, coal, iron and steel, iron castings, ironmongery, timber, paints

and oils, lime, brushes, cement, teaming, stationery, etc. Further particulars and forms of tender may be obtained on application to Mr. Henry Dearden, Assoc.M.Inst.C.E., Borough and Water Engineer, Town Hall, Dewsbury. Tenders, under sealed covers, endorsed "Tenders for ——" (naming the material), must be in hands of Mr. H. Ellis, Town Clerk, Town Clerk's Office, Town Hall, Dewsbury, not later than 12 noon on July 16.

JULY 18.—**Leamington Spa.**—ROADSTONE.—Leamington Spa Corporation invite tenders for the supply of about 3,500 tons of roadstone. The tenders are to state prices per ton for hand-broken metal, machine-broken metal, chippings for road binding, chippings for footways. Any of these materials to be delivered carriage free in such quantities and at such times during the next twelve months as may be ordered by the Borough Engineer. Tenders (form of which may be obtained at the Borough Engineer's Office), endorsed "Tender for Roadstone," to be sent to Mr. Leo. Rawlinson, Town Clerk, Town Hall, Leamington, before noon on July 18.

JULY 18.—**Leeds.**—MATERIALS.—Leeds Street Lighting Committee invite tenders for supply of the following articles for the ensuing year:—Copper lamps; lamp furniture; lamp pillars; pillar lamp irons, carriages, etc.; sheet copper, etc.; glass for lamps. The Committee also invite offers for purchase of about a ton of clean scrap copper. Further particulars and forms of tender may be obtained on application to the Superintendent of Street Lighting, Springwell-street Depôt, between 9 and 11 a.m. daily. Tenders, properly endorsed, to be delivered at office of Mr. Robert E. Fox, Town Clerk, not later than July 18.

JULY 21.—**Harrow.**—GRANITE AND GRAVEL.—Harrow-on-the-Hill U.D.C. invite tenders for the supply of about 2,000 tons of 2-in. or 1½-in. broken granite, and 1-in. or ½-in. granite chippings, delivered free in such quantities and at such times prior to March 31, 1907, as may be ordered by the Council's Surveyor at the Harrow Railway Stations (London and North-Western Railway or Metropolitan). Tenders are also invited for the supply of about 120 yds. of coarse gravel and 150 yds. of fine gravel, to be delivered free at the Harrow Metropolitan Station, in such quantities and at such times prior to March 31, 1907, as the Council's Surveyor may direct. Samples of granite and gravel to be sent to the Surveyor's Office, carriage paid, before the date of the delivery of the tenders. Tenders, endorsed "Tender for Granite" (or "Gravel," as the case may be), to be sent to Mr. J. Percy Bennetts, Surveyor to the Council, Harrow, on or before July 21.

JULY 25.—**Wanstead.**—STONE.—Wanstead U.D.C invite tenders for 2,000 tons (more or less) of Guernsey granite or Quenast stone, broken to 1½-in. cube, delivered to Snaresbrook Station (G.E. Railway) by such instalments and in such quantities as may be directed in writing from time to time by the Council's Surveyor, beginning September 1 next. Forms of tender can be obtained on application to the Surveyor at the Council Offices. Tenders, sealed and enclosed in the envelopes provided, are to be delivered at the Council Offices not later than July 25.

AUGUST 1.—**Litherland.**—MATERIALS.—The Litherland District Council invite tenders for the following materials, viz.:—About 250 tons of the best Welsh macadam, and about 25 tons of granite chippings, during the ensuing twelve months. The macadam and chippings to be delivered at the Alexandra or Langdon Dock at such times and in such quantities as may be required. Samples must be forwarded carriage paid to Mr. A. H. Carter, Surveyor, Public Offices, Sefton-road, Litherland, not later than August 1. Specification and form of tender can be obtained on application to the surveyor, as above, any morning between 9 a.m. and 11 a.m. Tenders, endorsed "Tenders for Macadam and Chippings," to be sent to Mr. Wm. Kirk and Mr. J. W. Allen North, Clerks to the Council, 15, Lord-street, Liverpool, not later than August 1.

* AUGUST 2.—**Ashford.**—PLANT AND MATERIALS.—Tenders are invited for supply and erection on the premises at Ashford, Middlesex, of materials as under, for the Managers of West London District Schools:—(1) Pipework, and sundry apparatus for exhaust steam-heating system; (2) pipe trenches and sundry builder's work; (3) chimney shaft economiser chamber and flues; (4) two 50 k.w. steam dynamos (high-speed D.A. vertical compound engines) and boosters, an electric motor, additions and alterations to switchboard, some 200 yds. of cable, etc.; (5) alterations and extensions to steam exhaust feed and drain pipes, and Green's economiser, etc. General conditions, specifications, drawings, and forms of tender to be had from the Clerk to Managers, at the schools, on deposit of 1*l.* 1*s.* for each section. Schools may be inspected between 10 a.m. and 4 p.m. Tenders must be delivered to the Clerk to the Managers, Ashford, Middlesex, not later than 6 p.m., Thursday, August 2.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*INSTRUCTOR of BUILDING CONSTRUCTION	East Ham Technical College	10s. 6d. per evening of two hours	July 23
*TECHNICAL ASSISTANT PARKS' DEPARTMENT	London Council Council	150*l.*	do.
*SECOND-CLASS DRAUGHTSMAN	Metropolitan Asylums Board	125*l.*	do.
*ASSISTANT ENGINEERS (TWO)	Colombo Mun. Coun. (Ceylon)	Rs.5,000 per annum, etc.	July 24

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD BUILDING SITE, WARDOUR-STREET—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	July 17
*FREEHOLD BUILDING ESTATE, ISLEWORTH—At the Mart	Boyton, Sons, & Trevor	July 18
*FREEHOLD BUILDING ESTATE, NEW MALDEN—At the Mart	Douglas Young & Co.	do.
*FREEHOLD BUILDING LAND, CROYDON—At the Mart	Chesterton & Sons	July 19
*FREEHOLD BUILDING LAND, MILL HILL, HENDON—Adam and Eve Hotel, Mill Hill	Protheroe & Morris	do.
*BRICK & TILE BUSINESS, STOKE-ON-TRENT—At the North Stafford Hotel, Stoke-on-T.	C. Butters & Sons	do.
*FREEHOLD BUILDING SITE, DALSTON-LANE—At the Mart	Joseph Hibbard & Sons	July 20
*FREEHOLD BUILDING SITE, BOW—At the Mart	Mark Liell & Son	July 24
*FREEHOLD BUILDING SITES, RICHMOND BRIDGE—Greyhound Hotel, Richmond	Ernest Pennington	July 26
*FREEHOLD SITE, HAGGERSTON—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	do.
*PLANT, MACHINERY, AND STOCK—103, Lavender-hill, Battersea, S.W.	Fuller, Horsey, Sons, & Cassell	do.
*BRICKMAKING PLANT, BERMONDSEY—55A, Southwark Park-road, S.E.	Ventom, Bull, & Cooper	No date.

SALES OF PROPERTY.—*Continued from page 56.*

Forest Gate.—175, 176, and 177, Forest-la.; also the "Fox and Hounds" b.h., u.t. 12 yrs., g.r. nil, y.r. 177*l.* £1,750

By CARTWRIGHT & ETCHES.

Battersea.—25 to 31 (odd), Orville-rd., u.t. 79 yrs., g.r. 28*l.*, w.r. 175*l.* 380
Pimlico.—2, Moreton-pl., u.t. 23 yrs., g.r. 8*l.*, y.r. 52*l.* 400
Tooting.—55 and 57, Cloudesdale-rd., u.t. 84 yrs., g.r. 13*l.*, y.r. 76*l.* 760

By C. F. GODDARD.

St. John's Wood.—8, Springfield-rd., u.t. 31 yrs., g.r. 7*l.*, e.r. 65*l.* 380
Maida Vale.—71, Canterbury-ter., u.t. 53 yrs., g.r. 8*l.*, y.r. 60*l.* 475
Hyde Park.—6 and 22, Titchborne-st., u.t. 14 yrs., g.r. 15*l.* 7*s.*, y.r. 100*l.* 510

By E. H. HENRY.

Clapham.—1 and 3, Park-hill, f., y.r. 90*l.* 1,100
Clapham Park-rd., a freehold building site .. 1,100

By WM. HOUGHTON.

Wanstead.—1, Elizabeth-ter. and "Woodbine Cottage," f., y.r. 35*l.* 520
Leyton.—Francis-rd., f.g.r. 4*l.* 10*s.*, reversion in 91 yrs. 110
Walthamstow.—18 and 20, Salisbury-rd., f., p. 600

By WEATHERALL & GREEN.

Hyde Park.—Queen's-gdns., f.g. rents 60*l.*, reversion in 49 yrs., ... 1,950
St. John's Wood.—Alma-sq., f.g.r. 22*l.*, reversion in 49 yrs. 580
1 and 3, Hill-rd., f., y.r. 140*l.* 2,440
9 and 11, Abbey-rd., f., y.r. 240*l.* 3,725
Alma-sq., The "Heroes of Alma" p.h., freehold rental of 60*l.*, reversion in 13 yrs. 1,700
Edgware-road.—7, John-st. (s.), f., y.r. 55*l.* 1,000
New Southgate.—East-rd., "Bridge Nursery" and 1 a. 3 r. 18 p., f. 650

By G. A. WILKINSON & SON.

City.—42, Bishopsgate-st. Within (s.), f., y.r. 285*l.* 6,850
Brighton.—18, North-st. (s.), c., y.r. 170*l.* 3,240

July 3.—By CHANCELLOR & SONS.

Bow, Devon.—The Spratos Estate, 597 a. 0 r. 28 p., f. 7,100

By CHINNOCK, GALSWORTHY, & CO.

Holborn.—81, 85, 87, Leather-la. (s.), f., y.r. 295*l.* 5,810

By DEBENHAM, TEWSON, & CO.

St. John's Wood.—Queen's-rd., f.g.r. 25*l.*, reversion in 64 yrs. £655

By R. A. ENRIGHT.

Cannonbury.—35, Pyrland-rd., u.t. 43 yrs., g.r. 6*l.* 6*s.*, y.r. 46*l.* 375
85, Petherton-rd., u.t. 45 yrs., g.r. 7*l.* 7*s.*, e.r. 60*l.* 490

By OSBORN & MERCER.

Watford, Herts.—Garston, a freehold holding, 23 a. 3 r. 10 p., p. 2,480

By ROGERS, CHAPMAN, & THOMAS.

Pimlico.—49, Lupus-st., u.t. 31 yrs., g.r. 9*l.* 10*s.*, p. 530
101, Belgrave-rd., u.t. 27½ yrs., g.r. 14*l.*, p. .. 1,060

By ST. QUINTON & SON.

City.—4, Goldsmith-st. (business premises), u.t. 50 yrs., g.r. 168*l.*, y.r. 450*l.* 2,275

By J. F. STONEHEWER & SONS.

Wandsworth.—132, Merton-rd., f., y.r. 28*l.* 415

By C. P. WHITELEY (at Hastings).

Hastings, Sussex.—2, East-parade, f., y.r. 35*l.* 400

By H. J. WAY & SON (at Newport).

Carisbrooke, etc., Isle of Wight.—"Veres Farm," 61 a. 0 r. 5 p., f. 2,350

July 4.—By B. BAILEY & CO.

Broomfield, Essex.—"Patching Hall Farm," 195 a. 2 r. 29 p., f. (including the Manor of Patching Hall) 4,400
Enclosures of land, 16 a. 3 r. 33 p., f. 460
Three parcels of building land, f. 530

By JOHN BOTT & SONS.

Tooting.—56, Trinity-rd., u.t. 73 yrs., g.r. 10*l.*, y.r. 35*l.* 315

By DAVID BURNETT & CO.

Knightsbridge.—1, Rutland-gate-mews, u.t. 28½ yrs., g.r. nil, p. 260
Shortlands, Kent.—180, Bromley-rd., f., y.r. 65*l.* 1,050

By DOUGLAS YOUNG & CO.

Chalk Farm.—94 and 96, Belmont-st., u.t. 59 yrs., g.r. 13*l.*, y.r. 70*l.* 600
Finsbury Park.—3, Woodstock-rd., u.t. 60 yrs., g.r. 6*l.*, y.r. 40*l.* 350
Clapham.—34, Kenwyn-rd., u.t. 79 yrs., g.r. 7*l.* 10*s.*, y.r. 44*l.* 370
Dulwich.—1, Ilderaley-rd., u.t. 70 yrs., g.r., etc., 8*l.* 17*s.* 11*d.*, y.r. 40*l.* 320
Acton.—6 and 8, Hereford-rd., u.t. 87 yrs., g.r. 10*l.* 10*s.*, y.r. 72*l.* 600

By GEORGE SYMONDS (at Bury St. Edmunds).

Thelnetham, Suffolk.—"The Lodge Farm," 180 a. 2 r. 5 p., f. £2,300
Five freehold cottages and 26 a. 3 r. 30 p., f. 595
Gislingham, Suffolk.—"The Potash Farm," 115 a. 1 r. 4 p., f. 1,140
"The Green Farm," 86 a. 2 r. 4 p., f. 720
A freehold cottage and 0 a. 3 r. 16 p. 130
"The Street Farm," 42 a. 1 r. 9 p., f. 570

By W. BROWN & CO. (at Chesham).

Chartridge, Bucks.—"Little Friars Hill" and 50 a. 2 r. 28 p., f., y.r. 50*l.* 1,280
Hawridge, Bucks.—"Vale" or "Bottom" Farm, 88 a. 3 r. 27 p., f., y.r. 76*l.* 2,230
Heath End House, cottage and 17 a. 0 r. 7 p., f., p. 800

By RUMBALL & EDWARDS (at St. Albans).

Redbourn, Herts.—"Bylands Farm," 52 a. 2 r. 19 p., f. 1,520
Various enclosures, 75 a. 0 r. 14 p., f. 1,665
Three pieces of common land, 4 a. 2 r. 2 p., f. 135
Harpenden, Herts.—Enclosures of land, 14 a. 2 r. 26 p., f. 385

By MADDISON, MILES, & MADDISON (at Yarmouth).

Yarmouth.—3, Euston-rd. and stable in rear, f., y.r. 28*l.* 10*s.* 588
10, Herbert-ter., f. 200
128, Northgate-st., f., y.r. 15*l.* 270
31 and 32, Hammond-rd. and house adjoining, f. 456

By JAMES W. TAYLOR (at Chipping Norton).

Salford, Oxon.—"The Manor Farm," 342 a. 0 r. 31 p., f., y.r. 284*l.* 5,000

By PERKINS & SONS (on the Premises).

Southampton—Shirley, "Westfield" and ½ an acre, f., p. 1,000

July 5.—By MILLAR, SON, & CO.

Bideford, Devon.—"The Cleave" and 4½ acres, f., p. 2,000

By JOSEPH STOWER.

Twickenham.—St. Margaret's-rd., a freehold building estate, 3 a. 3 r. 29 p. 3,600

By WM. WESTON.

St. John's Wood.—65, Boundary-rd., u.t. 68 yrs., g.r. 12*l.* 12*s.*, p. 355

By J. T. SKELDING.

Dalston.—24, Navarino-rd., u.t. 46½ yrs., g.r. 6*l.*, y.r. 48*l.* 500

By STIMSON & SONS.

Fulham.—1 to 11 (odd), Armadale-rd., f., w.r. 404*l.* 6s. £3,000
Camberwell.—16, Wells-cres., f. w.r. 39*l.* 360
Norbury.—Pollards Hill South, "Sedleigh," f., p. 600
Bow.—18, Harley-rd., u.t. 27 yrs., g.r. 4*l.* 10s., y.r. 38*l.* 280
Stoke Newington.—13, Mildmay-gr., u.t. 54½ yrs., g.r. 7*l.*, e.r. 38*l.* 320
Peckham.—Sumner-rd., etc., f.g.r. 17*l.*, reversion in 36½ yrs. 650
Brockley.—91 and 93, Brockley-rd. (s.), u.t. 62 yrs., g.r. 12*l.* 14s., y.r. 60*l.* 600
Wandsworth.—Garratt-la., f.g.r. 7*l.*, reversion in 60 yrs. 250
Hackney.—59, Sydner-rd., u.t. 64 yrs., g.r. 5*l.*, y.r. 30*l.* 270

July 6.—By BRADEL, WOOD, & CO. & TOPLIS & HARDING.

Enfield.—Bush Hill-pk., Queen Anne's gr., a plot of freehold building land 245
Village-rd. (near), a plot of freehold land 225

By BUNCH & DUKE.

Hackney.—3 to 8, Queen Anne-rd., u.t. 38½ yrs., g.r. 18*l.*, w.r. 234*l.* 1,150
Clapton.—19, Median-rd. (s.), f., y.r. 40*l.* 500

By FULLER & FULLER.

Balham.—90, 92, 94, and 104, Bedford-hill (s.), u.t. 70 yrs., g.r. 46*l.*, y.r. 203*l.* 2,060

By DENT, DALLAS, & NORMAN.

Fulham.—Cedar-rd., l.g.r. 45*l.*, u.t. 44½ yrs., g.r. 2*l.* 10s. 590
Regent's Park.—Park Village East, f.g.r. 30*l.*, u.t. 16½ and 15½ yrs., g.r. 7*l.* 215

By WAGSTAFF & SONS.

Highbury.—27, Northolme-rd., u.t. 82 yrs., g.r. 7*l.* 10s., e.r. 50*l.* 490
Holloway.—Fairbridge-rd., f.g.r. 31*l.* 10s., reversion in 61 yrs. 780
Walthamstow.—Forest-rd., f.g.r. 35*l.* 18s., reversion in 88 yrs. 790

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

Remittances (payable to J. MORGAN) should be addressed to The Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post.*

MEETINGS.

SATURDAY, JULY 14, TO SATURDAY, JULY 21.

The Junior Institution of Engineers.—Saturday, July 14: Reception by the Ex-Mayor of Southport at the Town Hall; visit the Corporation Gas and Electricity Estates and Tramways Undertaking. Monday: Reception by the Lord Mayor of Manchester at the Town Hall; visit the British Westinghouse Electric and Manufacturing Company's Works, the Municipal School of Technology, and Messrs. S. Schwabe & Co.'s Calico Printing Works. Tuesday: Excursion to Scarisbrick Hall. Wednesday: Visit National Gas Engine Works, Cedar Mill and Atlas Mill. Thursday: Visit the Rose Bride and Douglas Bank Colliery, Wigan, and Messrs. Coop's Clothing Factory. Friday: Visit places of local interest at Southport; Institution Summer Dinner in evening at the Queen's Hotel, Southport, to meet the Lord Mayor of Manchester and other guests.

SATURDAY, JULY 21.

Association of Municipal and County Engineers.—Western Counties District Meeting, to be held at Trowbridge and Devizes.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 9 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 6 0	" " "
Picked Stocks for Facings	2 15 0	" delivered.
Flettons	1 7 0	" at railway depôt
Red Wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	6 9	per yard, delivered.
Thames Ballast	5 3	" "
Best Portland Cement	25 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 10	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks.	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks.	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super., "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

	s. d.	
Hopton Wood (Hard Bed) in blocks	2 0	per ft. cube, deld. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. sawn both sides random slabs	1 0	" "
" " " 2 in. do.	0 8½	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "

SLATES (*continued*).

In. In.	£ s. d.	
16×8 " "	7 5 0	per 1000 of 1200 at r.d
20×10 best blue Portmadoc	12 12 6	" "
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz.
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 "
Do. Ornamental do.	60 0	" "
Hip tiles	4 0	per doz at rly. depôt.
Valley tiles	3 0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 "
Do. Ornamental do.	54 6	" "
Hip tiles	4 1	per doz. "
Valley tiles	3 8	" "
Best "Rosemary" brand plain tiles	48 0	per 1000 "
Best Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 8	" "
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 "
Do pressed	47 6	" "
Do. Ornamental do.	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 6	" "

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	... 9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.)	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0

JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	... 25 0 0
3 in. by 9 in.	22 0 0	... 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	6 10 0	... 18 0 0
Second yellow deals, 3 in. by 11 in.	18 10 0	... 20 0 0
" " 3 in. by 9 in.	17 10 0	... 19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	... 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	... 15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	... 12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	... 22 10 0
Do. 3 in. by 9 in.	18 0 0	... 19 10 0
Battens	13 10 0	... 15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	... 17 0 0
Do. 3 in. by 9 in.	14 10 0	... 16 0 0
Battens	11 0 0	... 12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	... 14 0 0
Do. 3 in. by 9 in.	12 10 0	... 14 0 0
Battens	10 0 0	... 11 0 0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	14 10 0	... 15 10 0
" " 3 in. by 9 in.	13 10 0	... 14 10 0
Battens	11 0 0	... 12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	... 14 10 0
" " 3 in. by 9 in.	12 10 0	... 13 10 0
" " battens	10 0 0	... 11 0 0
Pitch-pine: deals	18 0 0	... 21 0 0
Under 2 in. thick extra	0 10 0	... 1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Yellow Pine oddments	28 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	... 0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	... 0 3 6
Small " "	0 2 6	... 0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	... 0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	... 0 0 9½
¾ in. do. do	0 0 7	... —
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	... 0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	... 0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	... 0 1 0
Teak, per load	17 0 0	... 22 0 0
American Whitewood Planks, per ft. cube	0 4 0	... 0 5 0

Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	... 0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	... 0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	... 1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	... 0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	... 0 15 0

WOOD (continued).

Prepared Flooring, etc. (continued)—	Per square. £ s. d.		£ s. d.
1¼ in. by 7 in. white, planed and matched	0 15 0	...	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	...	0 13 6
1 in. by 7 in. " "	0 14 0	...	0 18 0
¾ in. by 7 in. white " "	0 10 0	...	0 11 6
1 in. by 7 in. " "	0 12 9	...	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	...	7 10 0
Compound Girders, ordinary sections	9 0 0	...	10 0 0
Steel Compound Stanchions	12 0 0	...	13 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	...	10 0 0
Flitch Plates	9 0 0	...	10 0 0
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	...	8 10 0

METALS. Per ton, in London.

	£ s. d.		£ s. d.
IRON—			
Common Bars	8 0 0	...	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	...	9 0 0
Staffordshire "Marked Bars"	10 10 0	...	—
Mild Steel Bars	8 15 0	...	9 0 0
Hoop Iron, basis price	9 5 0	...	9 10 0
" " Galvanised	17 0 0	...	—
("And upwards, according to size and gauge.)			
Sheet Iron Black—			
Ordinary sizes to 20 g.	9 10 0	...	—
" " 24 g.	10 10 0	...	—
" " 26 g.	12 0 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality—			
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14 0 0	...	—
Ordinary sizes to 22 g. and 24 g.	14 10 0	...	—
" " 26 g.	15 0 0	...	—
Sheet Iron, Galvanised, flat, best quality—			
Ordinary sizes to 20 g.	17 0 0	...	—
" " 22 g. and 24 g.	17 10 0	...	—
" " 26 g.	19 0 0	...	—
Galvanised Corrugated Sheets—			
Ordinary sizes 6 ft. to 8 ft. 20 g.	14 0 0	...	—
" " 22 g. and 24 g.	14 10 0	...	—
" " 26 g.	15 15 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 10 0	...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 10 0	...	—
" " " 26 g.	14 15 0	...	—
Cut Nails, 3 in. to 6 in.	9 10 0	...	9 15 0
(Under 3 in., usual trade extras.)			

LEAD, &c. Per ton, in London.

	£ s. d.		£ s. d.
LEAD—Sheet, English, 3lb. and up.	18 17 6	...	—
Pipe in coils	19 7 6	...	—
Soil pipe	21 17 6	...	—
Compo pipe	21 17 6	...	—
ZINC—Sheet—			
Vieille Montagne ...ton	33 0 0	...	—
Silesian	32 15 0	...	—
COPPER—			
Strong Sheet ...per lb.	0 1 1	...	—
Thin " "	0 1 2	...	—
Copper nails "	0 1 0	...	—
BRASS—			
Strong Sheet "	0 1 0	...	—
Thin " "	0 1 1	...	—
TIN—English Ingots "	0 1 10	...	—
SOLDER—Plumbers' "	0 0 9	...	—
Tinmen's "	0 0 11	...	—
Blowpipe "	0 1 0	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	1¾d. " "
21 oz. thirds	3½d. " "
" fourths	2½d. " "
26 oz. thirds	4½d. " "
" fourths	3½d. " "
32 oz. thirds	5d. " "
" fourths	4½d. " "
Fluted Sheet, 15 oz.	3½d. " "
" 21 oz.	4½d. " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d. per ft delivered.
⅛ "	2½d. " "
¼ "	3d. " "
Figured and Oxford Rolled "Oceanic" Glass, white ...	4d. " "
Do. " tinted ...	5½d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 10
" " " in barrels	"	0 1 11
" " " in drums	"	0 2 1
Boiled " " in pipes	"	0 2 0
" " " in barrels	"	0 2 1
" " " in drums	"	0 2 3
Turpentine in barrels	"	0 3 10
" in drums	"	0 4 0
Genuine Ground English White Lead	per ton	22 10 0
Red Lead, Dry	"	21 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c. Per gallon.

	£ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0

VARNISHES, &c. (continued). Per gallon.

	£ s. d.
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112 Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XC. (January to June, 1906) is given as a supplement with the current issue.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings price 9d. each

THE NINETIETH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence, will be ready on the 20th inst.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

Six lines or under ... 6s. 0d.
Each additional line ... 1s. 0d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ... 4s. 0d.
Each additional line (about ten words) ... 0s. 6d.

Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).

Four lines (about thirty words) or under ... 2s. 0d.
Each additional line (about ten words) ... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to HALF-PAST ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST TWELVE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. (By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ASPLEY HEATH (Beds).—For residence, for Mr. F. Tyers. Messrs. Stonebridge & Foll, architects, Woburn Sands, Beds:—

E. Martin	£785	C. Sinfield	£641
F. & T. Gregory	700	W. T. Sharpe	535
Mann & Son	684	G. H. Tranfield*	500
G. B. Tutt	658		

AYLESBURY.—For pulling down two old brick bridges, and constructing two steel girder bridges, etc. for the Urban District Council. Mr. W. H. Taylor, Engineer and Surveyor, Town Hall, Aylesbury:—

A. Thorne	£5,250 10 0	Webster & Cannon	£2,688 0 0
Wilkinson Bros.	3,682 0 0	W. T. Green & Co., Aylesbury*	2,576 0 0
Kirk & Randall	3,395 0 0		
D. T. Jackson	3,175 1 3		
G. J. Fisher	2,984 0 0		

BROCKLEY.—For detached house, Lowther-hill, Brockley Park Estate, for Mr. C. Burton Smith. Messrs. Garrood & Harrison, architects, Birkbeck Bank-chambers, Holborn, W.C.:—

Leasby & Salmon, 224, Hither-green, S.E.* £610

BRYMBO.—For drainage works, Brymbo, near Wrexham, for the Rural District Council. Mr. J. Price Evans, C.E., Argyle-chambers, Wrexham:—

F. Mitchell & Son	£3,514 10 0	T. Ll. Davies	£3,298 7 0
Davies Bros.	3,424 12 4	T. H. Simmons	3,209 10 2
J. T. Jones	3,413 13 8	R. Williams, Brymbo, Wrexham*	3,101 11 3
A. J. Cottle	3,338 18 9		

BUCKNALL.—For the provision of a steam heating installation to the enteric fever pavilion at the Bucknall Infectious Diseases Hospital, Staffs, for the Hanley, Stoke, Fenton, and Longton Joint Hospital Board. Mr. E. Jones, architect, 10, Albion-street, Hanley:—

W. Boulton, Ltd.	£170 0	W. Tagg & Co.	£109 10
E. Lounds	148 10	T. Hughes	108 10
W. Fradley	132 0	T. Bickley & Co., Hanley*	98 0
E. Peake & Sons	123 15		

CAERPHILLY.—For twenty or more dwelling-houses on Pontygwindy-road, Caerphilly, for the Trustees of the Mutual Building Club. Mr. G. L. Watkins, architect, Rectory-road, Caerphilly:—

Per house.		Per house.	
H. Davies & Son	£223 10 0	D. Williams	£199 0 0
H. P. Jones	220 0 0	R. & J. Evans, 35, Graig-y-fedw, Caerphilly*	198 10 0
Hamilton & Millard	217 10 0		
J. Williams	209 0 0		
T. F. Howells	205 0 0	R. W. Jones	197 17 6

CAERPHILLY.—For ten dwelling-houses on Pontygwindy-road, Caerphilly, for the Trustees of the Central Caerphilly Building Club. Mr. G. L. Watkins, architect, Rectory-road, Caerphilly:—

Per house.		Per house.	
H. Davies & Son	£223 10	T. F. Howells	£200 0
H. P. Jones	220 0	R. & J. Evans, 35, Graig-y-fedw, Caerphilly*	200 0
Hamilton & Millard	217 10		
J. Williams	208 0		

CROWBOROUGH.—For Crowborough and Jarvis Brook drainage (Contract No. 1), for the Uckfield Rural District Council. Messrs. J. Taylor, Sons, & Santo Crimp, civil engineers, Caxton House, Westminster:—

F. Murray & Co., St. Leonards-on-Sea,* at schedule of prices.

[Over forty other tenders.]

DARTFORD.—For repairing and remaking certain roads at Joyce Green Smallpox Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

S. J. Brice & Sons	£2,100
J. C. Trueman	1,963
W. Wilson	1,700
Grounds & Newton	1,550
T. Adams	1,549
W. H. Wheeler	1,400
Road Maintenance and Stone Supply Co., Ltd., Gravesend*	1,396

DROITWICH.—For drainage works at the sewage works, for the Corporation. Mr. H. Hulse, surveyor:—

C. Jones, Droitwich‡ ... £542 13 6

‡ Subject to approval of Local Government Board.

FERRYHILL (Durham).—For erecting twenty-two cottages at Deanbank, for the Bishop Auckland Co-operative Society. Mr. F. H. Livesay, architect and surveyor, 107, Newgate-street, Bishop Auckland:—

Masons: Robson & Gargett, Coundon*	£2,415 12 10
Joiners: Co-operative Society, Bishop Auckland*	717 18 0
Slater: J. R. Mascall, Bishop Auckland*	259 9 0
Plumber: W. Wilson, Spennymoor*	300 0 0
Plasterer: W. Laycock*	370 0 0
Painter: W. Wilson, Spennymoor*	80 0 0

GOSPORT.—For erecting a school in Clarence-square, for the Gosport and Alverstoke Education Committee. Mr. H. Frost, architect, Gosport. Quantities by Mr. H. A. F. Smith, Gosport:—

C. J. Lear & Son, Alverstoke, Hants* ... £4,346

[Thirteen other tenders were submitted, ranging from £4,383 to £5,814.]

GUILDFORD.—For constructing a reservoir in ferro-concrete on the Hennebique system and for other works, for the Town Council. Mr. C. G. Mason, Borough Engineer and Surveyor, Guildford:—

Duke & Ockenden	£1,411 18 5	Playfair & Toole	£1,252 0 6
Smith & Co.	1,324 14 10	Dickinson & Bunce, Guildford*	1,198 15 0
R. Neale	1,273 19 3		

HARROGATE.—For private street works in Back-road at the side of No. 4, and extending to the rear of No. 16, Chatsworth-place and Back Hollin's-road, for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Harrogate. Quantities by Surveyor:—

For Back-road at side of No. 4, and extending to the rear of 16, Chatsworth-place.

R. Annakin, 7, Dragon-avenue, Harrogate* £126 16 4

Back-road on west side of Hollin's-road.

A. Leedham, 4, Park-villas, New Park, Harrogate* ... £327 4 1

HEATH TOWN.—For making-up Tudor-road, for the Urban District Council. Messrs. Berrington, Son, & Martin, engineers, Lichfield-street, Wolverhampton:—

H. Holloway	£607 0 0	J. Owens, Wolverhampton*	£539 11 5
W. H. Reading	560 0 0		

HIGHER BEBINGTON.—For forming footpaths, kerbing, channelling, and draining part of Mount-road, for the Urban District Council. Mr. C. M. Lloyd, surveyor, King-street, Rock Ferry:—

J. Lee & Son, Higher Bebington, Cheshire*	£216 0 0
F. G. Davies & Co.	212 15 11

HORNSEA (Yorkshire).—For constructing a concrete sea-wall, promenade, and groynes, for the Urban District Council. Mr. W. T. Douglas, engineer, 15, Victoria-street, Westminster:—

A. Fasey & Son, Leytonstone, London, E.*. £11,875 6 5

[Twenty-two tenders. Highest, £22,580 5s. 8d.; lowest, £10,870.]

ILFORD.—For street works, Durban, Colenso, Wellesby, Lockwood, and Dunedin roads, etc., for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford:—

Parsons & Parsons, The Wharf, Ilford* ... £1,373 1 5

LEEDS.—For erecting a woollen mill, Dewsbury-road, Beeston, for Mr. W. Douglas. Messrs. T. A. Buttery & S. B. Birds, architects, 1, Basinghall-square, Leeds:—

Masons and Joiners: H. Atkinson & Sons, Carlton Hill, Leeds*	£3,175 0 0
Plumber: T. Chappell, Commercial-street, Morley*	275 11 0
Plasterer and Concreter: F. Mountain, Manor-road, Holbeck*	285 0 0
Slater: J. Kellett, Fountain-street, Morley*	230 0 0
Iron and Steel Work: Brooks, Roberts, & Co., Ltd., Bramley*	1,039 0 0
Patent Glazing: Heywood & Co., Huddersfield*	182 16 3

HENDON.—For private street improvements, Ebenezer road and mews, Child's Hill, for the Urban District Council. Mr. S. Slater Grimley, Engineer, Council Offices, Hendon :—

—	Finchley-road Sewer.	Finchley-road S. W. Drain.	Golders Hill-road Sewer.	Hermitage-lane S.W. Drain.	Ebenezer-road.	Ebenezer-mews.	—
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. Mowlem & Co., Pimlico	2,728 0 0	2,123 0 0	441 0 0	186 0 0	398 0 0	429 0 0	6,305 0 0
J. G. Brummell, Willesden	2,428 18 6	2,250 2 6	425 2 6	210 2 6	374 10 11	456 2 2	6,144 19 1
T. Adams, Wood Green ..	2,572 9 1	2,030 7 2	459 5 0	200 15 6	405 8 4	418 15 6	6,087 0 7
G. G. Rayner, Croydon ..	2,344 3 3	2,220 7 9	359 1 6	219 10 6	393 3 1	449 19 6	5,986 5 7
J. & W. Drake, Hammersmith	2 422 7 3	1,969 1 4	435 18 6	211 8 10	376 3 0	390 8 0	5,805 6 11
J. Jackson, Plaistow	2,286 5 9	1,773 16 6	414 16 0	176 5 0	353 19 2	450 7 0	5,453 9 5
R. Ballard, Ltd., Child's Hill	2,161 15 11	1,859 2 6	379 9 8	192 16 3	382 15 4	390 1 6	5,366 1 2
O. T. Gibbons, Leytonstone*	1,955 0 0	1,750 0 0	340 0 0	115 0 0	367 0 0	446 0 0	4,973 0 0

LONDON BOARD OF EDUCATION TENDERS.

FOR PAINTING AND CLEANING CERTAIN SCHOOLS.

Camberwell, N., Credon-road, (Painting Interior and Exterior).

J. Scott Fenn	£978	E. Triggs	£752
W. J. Howle	937	E. Proctor & Son, 326, High-street, Plumstead*	723
H. Groves	875		
J. Greenwood, Ltd.	839		
W. Sayer & Son	793		

[Estimate of architect (Education), £650.]

Fulham, Sherbrooke-road (Painting Interiors of School and Centres.)

Lathey Bros.	£657 0	W. Brown & Sons.	£518 0
Bristow & Eatwell	597 0	Lole & Co, Trafalgar-square, Chelsea*	499 8
R. A. Jewell	587 0		
S. N. Soole & Son	543 0		

[Estimate of architect (Education), £522.]

Lewisham, Holbeach-road (Painting Interiors and Exteriors of Main School and Iron Buildings).

J. Scott Fenn	£715 15	H. Groves	£558 0
T. G. Sharpington	630 0	E. P. Bulled & Co.	555 0
H. Kent	597 0	W. Hayter & Son 62, Banning-street, East Greenwich*	549 10
T. D. Leng	589 0		
J. & C. Bowyer	580 0		
W. Young	563 0		

[Estimate of architect (Education), £520.]

Woolwich, Bloomfield-road (Painting Interior).

Enness Bros.	£567 0	W. Hayter & Son.	£482 10
J. Scott Fenn	518 0	E. Proctor & Son, 326, High-street, Plumstead*	438 0
T. D. Leng	504 0		
H. Groves	487 0		

[Estimate of architect (Education), £500.]

Dulwich, Goodrich-road (Painting Interior).

T. G. Sharpington	£775	J. & C. Bowyer	£536
E. P Bulled & Co.	730	Maxwell Bros.	529
H. Line	663	E. Triggs, 92, Thechase, Clapham*	520
J. Garrett & Son	621		

[Estimate of architect (Education), £560.]

Dulwich, Heber-road (Painting Interior).

E. P. Bulled & Co.	£757	J. Garrett & Son	£662
T. G. Sharpington	712	W. Johnson & Co., Ltd.	623
E. B. Tucker	694	Maxwell Bros, Ltd., 310, Brixton-road*	619
H. Line	691		
Rice & Sons	666		

[Estimate of architect (Education), £600.]

St. George-in-the-East, Berner-street (Painting Interior and Exterior).

J. Scott Fenn	£778 10	Barrett & Power	£636 0
A. E. Symes	740 0	H. Bouneau, 1A and 2, Royal Victor-place, Old Ford*	629 0
Vigor & Co.	689 0		
G. Barker	679 0		
A. W. Derby	673 0		

[Estimate of architect (Education), £630.]

St. Pancras, E., "Brecknock" (Painting Interiors and Exteriors of Boys'. Girls', and Infants' Schools).

J.C.Richards & Co.	£853 12	W. Chappell	£598 10
W. Cubitt & Co.	822 10	Stevens & Sons 1A, Yonge-park, Seven Sisters-road*	594 0
Cowley & Drake	744 0		
J. Stewart	698 10		
Marchant & Hirst	674 0		

[Estimate of architect (Education), £615.]

Southwark, W., West-square (Painting Interior).

A. H. Inns	£850	J. F. Ford	£615
G. Foxley	749	E. Triggs	610
T. Lapthorne & Co.	725	Maxwell Bros., Ltd., 310, Brixton-road*	529
W. Sayer & Son	647		
Rice & Son	636		

[Estimate of architect (Education), £560.]

Battersea, Battersea Park-road (Painting Interior).

Rice & Son	£565	J. Garrett & Son	£485
Martin, Wells, & Co., Ltd.	550	W. Johnson & Co.	479
W. A. King	545	W. Hornett	441
E. Flood	544	Holliday & Greenwood, Ltd., Brixton*	385
Lathey Bros.	497		

[Estimate of architect (Education), £400.]

Bow and Bromley, Knapp-road (Painting Interior).

J. Haydon & Sons	£458 0	A. W. Derby	£354 0
W. H. Lascelles & Co., Ltd.	401 0	G. Barker	333 0
A. E. Symes	398 0	Vigor & Co.	321 10
W. Silk & Son	394 0	Newell & Lusty, 24and26, Wilson-street, Poplar*	280 0
J. Scott Fenn	372 18		

[Estimate of architect (Education), £350.]

Clapham, Ponton-road (Painting Interior of Infants' School).

Rice & Son	£129 10	W. Johnson & Co., Ltd., Wandsworth-common*	£87 0
J. R. Sims	114 0		
Maxwell Bros., Ltd.	104 8		
E. Triggs	95 0		

[Estimate of architect (Education), £70.]

Battersea, Surrey-lane (Painting Interior of Main School and Cleaning Interiors of Centres and School for Deaf Children).

Martin, Wells, & Co., Ltd.	£654 0	S. N. Soole & Son.	£580 0
Lole & Co.	630 13	R. S. Ronald	525 0
Rice & Son	611 0	E. Triggs	514 0
W. A. King	586 0	E. Flood	513 0
J. Garrett & Son	558 0	Maxwell Bros., Ltd., 310, Brixton-road*	499 0
W. Chappell	549 0		

[Estimate of architect (Education), £600.]

Camberwell, N., Southampton-street (Painting Exterior).

W. A. King	£510 0	W. T. Bennett	£398 0
W. Fitch	495 17	W. Sayer & Son	382 0
W. H. King	479 0	H. Bragg & Sons, Ltd., 19, Robsart-street, Brixton-road*	287 0
W. V. Goad	455 0		
E. Triggs	441 0		
H. Line	433 0		

[Estimate of architect (Education), £358].

City of London, School of Photo-Engraving and Lithography (Painting Interior and Exterior).

W. Hornett	£245 0	H. Bragg & Sons, Ltd., 19, Robsart-street, Brixton-road*	£163 0
R. Harding & Sons	210 10		

[Estimate of architect (Education), £130].

Clapham, Linden Lodge (Painting Interior and Exterior).

R. A. Jewell	£92 0	W. Johnson & Co., Ltd., Wandsworth Common*	£58 0
R. S. Ronald	70 0		
W. A. King	68 10		
E. B. Tucker	62 15		

[Estimate of architect (Education), £75].

Finsbury, C., Risinghill-street (Painting Exterior).

W. Reason	£299	F. W. Harris & Co., Ltd.	£254
Patman & Fotheringham, Ltd.	278	Marchant & Hirst, 136, Highgate-road*	243
G.S.S. Williams & Sons	273		

[Estimate of architect (Education), £260.]

Fulham, Fulham Palace-road (Painting Interior and Exterior).

C. Johnson	£677 0 0	Lole & Co.	£510 12 6
J. C. Richards & Co.	662 0 0	J. Garrett & Sons	490 0 0
J. & M. Patrick	594 0 0	S. N. Soole & Son	447 0 0
R. S. Ronald	590 0 0	W. Brown & Sons, 195, Uxbridge-road, Shepherd's Bush*	439 10 0
E. Triggs*	546 0 0		
Spencer, Santo, & Co., Ltd.	540 0 0		

[Estimate of architect (Education), £490.]

Greenwich, Blackheath-road (Cleaning Interior of School and Painting Interiors and Exteriors of centres).

S. Musgrove	£388 16 0	W. J Howie	£249 0 0
W. Young	322 0 0	W. Banks, 18, Egerton-road, Greenwich*	244 15 6
T. D. Leng	315 0 0		
H. Groves	300 0 0		

[Estimate of architect (Education), £220.]

Hackney, C., Enfield-road (Painting Interior).

P. Robinson & Co.	£477 0	H. Willmott	£346 0
McCormick & Sons	444 0	G. Barker	345 0
H. Bouneau	378 0	Stevens Bros.	328 0
W. H. Lascelles & Co., Ltd.	372 0	W. Shurmur & Sons, Ltd, Riverside Works, Upper Clapton*	296 15
J. Grover & Son	363 0		
W. Silk & Son	347 10		

[Estimate of architect (Education), 350].

Hackney, C., Gayhurst-road (Painting Interior).

W. H. Lascelles & Co., Ltd.	£388	W. Shurmur & Sons, Ltd.	£294
A. W. Derby	339	H. Willmott	288
C. R. Price	314	Newell & Lusty, 24, Wilson-street, Poplar*	252
Barrett & Power	311		
W. Silk & Son	299		

[Estimate of architect (Education), £300].

Hackney, N., Northwold-road (Painting Interior and Exterior).

C. R. Price	£518 0	W. Silk & Son.	£369 0
J. Stewart	463 0	Stevens & Sons	346 0
Barrett & Power	406 0	H. Willmott, The Triangle, Hackney*	335 0
W. Shurmur & Sons, Ltd.	402 10		

[Estimate of architect (Education), £350].

Hackney, S., Berger-road (Painting Interior and Exterior of Special School).

J. Stewart	£71	W. Silk & Son.	£59
W. Shurmur & Sons, Ltd.	71	H. Willmott, The Triangle, Hackney*	51

[Estimate of architect (Education), £255.]

Hackney, S., Cassland-road (Painting Interior and Exterior).

A. W. Derby	£659	Barrett & Power	£488
J. Stewart	599	Newell & Lusty	465
W. H. Lascelles & Co., Ltd.	538	H. Willmott, The Triangle, Hackney*	382
W. Silk & Son	537		

[Estimate of architect (Education), £396.]

Haggerston, Fellows-stren (Cleaning Interior).

Staines & Sons	£120 0 0	J. Haydon & Sons, Durham Works, Tees-dale-street, Hackney-road*	£88 3 6
G. Barker	118 0 0		
Marchant & Hirst	108 0 0		
H. Willmott	103 0 0		
H. Bouneau	99 15 0		

[Estimate of architect (Education), £129.]

Hammersmith, Branckenbury-road (Painting Interior and Exterior of the Special School).

R. S. Ronald	£80	S. N. Soole & Son	£45
C. Johnson	62	W. Brown & Sons, 195, Uxbridge-road, Shepherd's Bush*	40
Spencer, Santo & Co., Ltd.	45		

[Estimate of architect (Education), £55.]

Hammersmith, Saunder's-road (Painting Interior and Exterior).

J. C. Richards & Co.	£536 0 0	S. N. Soole & Son.	£389 0 0
G. Foxley	465 0 0	W. Brown & Sons	384 17 6
A. H. Inns	431 0 0	Chinchen & Co., Berens-road, Kensal Green*	379 0 0
G. Godson & Sons	405 0 0		

[Estimate of architect (Education), £400.]

Holborn, Tower-street (Painting Interior and Exterior).

W. Hornett	£391 8	J. R. Sims, 58 and 60, Horseferry-road, Westminster*	£315 0
E. Triggs	377 0		
Martin, Wells, & Co., Ltd.	340 0		

[Estimate of architect (Education), £325.]

Hoxton, Curtain-road (Painting Interior).

W. Reason	£398 0	J. Grover & Son	£279 0
Staines & Son	330 0	J. Haydon & Sons, Durham Works, Teesdale-street, Hackney-road*	245 13
Parrott & Isom	296 0		
H. Bouneau	290 0		
W. Silk & Son	283 0		

[Estimate of architect (Education), £260.]

Islington, N., Duncombe-road (Painting Interior).

Cowley & Drake	£732 18	Marchant & Hirst	£688 0
Patman & Fotheringham, Ltd.	726 0	Stevens Bros.	566 0
McCormick & Sons	717 0	J. Stewart, 174, West-green-road, South Tottenham*	540 0
F. W. Harris & Co.	714 18		
Aldridge & Sons	698 0		
T. Cruwys	695 0		

[Estimate of architect (Education), £485.]

Kensington, N., Sirdar-road (Painting Interior).

J.C. Richards & Co.	£570 0	Chinchen & Co.	£393 0
G. Foxley	478 0	W. Brown & Sons, 195, Uxbridge-road, Shepherd's-bush*	369 0
S. N. Soole & Son	444 0		
A. H. Inns	416 10		
Bristow & Eatwell	407 0		
G. Godson & Sons	403 0		

[Estimate of architect (Education), £435.]

Kensington, S., "Fox" (Painting Interior).

H. C. Clifton	£450 0	Thompson & Beveridge	£227 10
J. Peattie	307 0	Bristow & Eatwell, Chinchen & Co.	249 0
G. Godson & Sons	266 0	63A, Lancaster-road*	207 10
A. H. Inns	242 18		

[Estimate of architect (Education), £225.]

Lewisham, Brockley-road (Painting Interior of Old and New Portions).

W. Young	£357 0	W. Banks, 18, Egerton-road, Greenwich*	£269 10
S. Musgrove	337 0		
J. & C. Bowyer	325 0		
W. J. Howle	277 0		

[Estimate of architect (Education), £325.]

Lewisham, Hither-green (Painting Interior).

Enness Bros.	£402 10	H. Groves, Stockwell-street, Greenwich*	£365 0
W. Hayter & Son	396 10	J. Scott Fenn	363 16
H. Kent	396 0	W. J. Howle	355 0
T. D. Leng	378 0		
W. Banks	374 10		

[Estimate of architect (Education), £350.]

Limehouse, Broad-street (Painting Interior).

A. E. Symes	£575 0	J. Scott Fenn	£457 10
J. Haydon & Sons	488 4	G. Barker	445 0
Barrett & Power	488 0	Vigor & Co., King-street, Poplar*	440 10
H. Bouneau	479 0		

[Estimate of architect (Education), £471.]

Limehouse, Farrance-street (Cleaning Interior and Painting Exterior).

Parrott & Isom	£470 0	A. W. Derby	£343 0
G. Barker	433 0	Staines & Son	330 0
A. E. Symes	421 0	Vigor & Co., King-street, Poplar*	319 10
Newell & Lusty	388 10		
H. Bouneau	383 5		

[Estimate of architect (Education), £300.]

Newington, W., Faunce-street (Painting Interior).

W. Fitch	£429 10 6	J. Parsons	£277 0 0
W. H. King	375 10 0	W. King & Son, 3, Vauxhall Bridge-road, Westminster*	268 0 0
T. Lapthorne & Co.	336 5 6		
J. F. Ford	292 0 0		
J. Appleby & Sons	278 0 0		

[Estimate of architect (Education), £310.]

Norwood, Sussex-road (Painting Interior).

E. Triggs	£407 0	H. Bragg & Sons, Ltd.	£329 0
T. Lapthorne & Co.	404 0	W. Read, 43, Church-road, Brixton-hill*	327 15
W. T. Bennett	403 0		
Lathey Bros.	393 0		
J. J. Richards	350 0		
Maxwell Bros., Ltd.	348 13		

[Estimate of architect (Education), £370.]

Norwood, Woodland-road (Cleaning Interior).

J. J. Richards	£199 10	J. & C. Bowyer	£147 0
E. P. Bulled & Co.	185 0	W. Johnson & Co., Ltd., Wandsworth-common*.	145 0
R. S. Ronald	182 0		
H. Leney & Son	176 0		
Lathey Bros.	173 0		

[Estimate of architect (Education), £145.]

Peckham, Colls-road (Painting Interior).

W. H. Lascelles & Co., Ltd.	£496 0	W. J. Howle	£414 0
W. Banks	493 10	H. Groves	410 0
J. Garrett & Son	450 0	W. T. Bennett, 293, Brixton-road*	396 0
J. & C. Bowyer	440 0	E. Proctor & Son	395 0
W. V. Goad	420 0		

[Estimate of architect (Education), £379.]

Poplar, Ricardo-street (Painting Exterior).

G. Barker	£155 0	Barrett & Power, St. Thomas' Works, Hackney*	£125 0
Vigor & Co.	146 0		
A. E. Symes	146 0		
J. Scott Fenn	138 15		
J. Haydon & Sons	130 18		

[Estimate of architect (Education), £150.]

St. Pancras, N., Burghley-road (Painting Interior of Old Building).

J. Peattie	£649 0	Marchant & Hirst	£522 0
Patman & Fotheringham, Ltd.	563 0	Stevens Bros.	438 0
Aldridge & Son	550 0	Thompson & Beveridge	404 10
W. Reason	549 0	J. Stewart, 174, West Green-rd., South Tottenham*	364 0
W. H. Lascelles & Co., Ltd.	545 10		
T. Cruwys	528 0		

[Estimate of architect (Education), £420.]

Rotherhithe, Keeton's-road (Painting Interior).

Rice & Son	£696 0	W. Sayer & Son	£446 0
W. H. Lascelles & Co., Ltd.	654 0	W. H. King	393 10
H. Line	593 0	Holliday & Greenwood, Ltd., Brixton*	359 0
J. Greenwood, Ltd.	457 0		

[Estimate of architect (Education), £395.]

St. Pancras, E., Great College-street (Painting Interior).

J. Peattie	£435 0 0	J. C. Richards & Co.	£361 0 0
F. W. Harris & Co., Ltd.	398 0 0	Marchant & Hirst	360 0 0
Stevens Bros.	378 0 0	G. Foxley, 27 Kingly-street, Regent-street*	359 0 0
T. Cruwys	375 0 0		
Cowley & Drake	371 16 6		
A. H. Inns	365 0 0		

[Estimate of architect (Education), £325.]

St. Pancras, N., Carlton-road (Painting Interior).

J. C. Richards & Co.	£694 0 0	Thompson & Beveridge	£508 10 0
G. Foxley	606 0 0	T. Cruwys	497 10 0
Aldridge & Son	584 0 0	Stevens & Sons, 1A, Yongepark, Seven Sisters-road*	446 0 0
Marchant & Hirst	575 0 0		
Cowley & Drake	556 3 9		
F. W. Harris & Co., Ltd.	513 0 0		

[Estimate of architect (Education), £400.]

Southwark, W., Hatfield-street (Painting Interior).

J. Parsons	£363 0	J. F. Ford, 89, Fitzalan-street, Kennington-road*	£331 0
W. Sayer & Son	357 0		
Rice & Son	343 0		
W. Hornett	340 15		
A. H. Inns	336 0	J. R. Sims	312 0

[Estimate of architect (Education), £380.]

Walworth, Flint-street (Painting Interior of Infants' School).

W. V. Goad	£145	W. H. King, 39A, Inville-road, Walworth*	£101
W. Sayer & Son	118		
J. F. Ford	109		

[Estimate of architect (Education), £100.]

Wandsworth, Eltringham-street (Painting Interior).

W. Hornett	£907 10	Martin, Wells, & Co., Ltd.	£540 0
W. Johnson & Co., Ltd.	612 0	E. R. Tucker	536 0
J. & M. Patrick	599 0	R. A. Jewell	501 0
Rice & Son	575 0	E. Triggs	499 0
Holliday & Greenwood, Ltd.	540 0	S. N. Soole & Son, Dunstable Works, Richmond*	497 0

[Estimate of architect (Education), £490.]

Westminster, "Millbank" (Painting Interior and Exterior).

G. Foxley	£593 0	H. Bragg & Sons, Ltd.	£359 0
W. H. Lacelles & Co., Ltd.	527 0	J. R. Sims, 58 and 60, Horseferry-road, Westminster*	348 0
A. H. Inns	414 17		
Rice & Sons	389 0		
Martin, Wells, & Co., Ltd.	370 0		

[Estimate of architect (Education), £330.]

Woolwich, Earl-street (Painting Interior and Exterior).

W. Young	£532 0	W. Banks	£447 10
Enness Bros.	487 0	E. Proctor & Son, 326, High-street, Plumstead*	350 0
W. Hayter & Son	449 10		
J. Scott Fenn	449 0		
W. J. Howie	448 0		

[Estimate of architect (Education), £460.]

Woolwich, Elizabeth-street (Painting Interior).

Enness Bros.	£262 0 0	W. J. Howie, 37, Blackheath-road, Greenwich*	£181 0 0
W. Banks	224 12 6		
E. Proctor & Son	200 0 0		
W. Hayter & Son	199 10 0		

[Estimate of architect (Education), £230.]

Woolwich, Greening-street (Painting Interior and Exterior of Iron Buildings).

W. Young	£138 0	Enness Bros.	£92 0
W. J. Howie	127 0	J. Scott Fenn, 42, William-street, Woolwich*	78 10
W. Hayter & Son	116 0		
E. Proctor & Son	95 0		

[Estimate of architect (Education), £65.]

Woolwich, Mazey-road (Painting Interior of Pupil Teachers' School).

Enness Bros.	£104 0 0	J. Scott Fenn	£89 10 0
E. Proctor & Son	100 0 0	H. Groves, Stockwell-st., Greenwich*	89 0 0
W. Banks	99 19 6		
W. Hayter & Son	94 10 0		
W. J. Howie	93 0 0		

[Estimate of architect (Education), £85.]

Woolwich, Mulgrave-place (Painting Interior).

T. G. Sharpington	£498 10	H. Groves	£312 0
W. Banks	369 15	J. Scott Fenn	308 0
Enness Bros.	340 10	W. J. Howie, 37, Blackheath-rd., Greenwich*	296 0
W. Hayter & Son	329 10		
E. Proctor & Son	315 0		

[Estimate of architect (Education), £310.]

Bethnal Green, N.E., Teesdale-street (Painting Interior and Exterior).

R. Woollaston & Co.	£2,043 0	J. Scott Fenn	£487 10
R. Bouneau	614 10	Barrett & Power, St. Thomas' Works, Hackney*	409 0
J. Haydon & Sons	597 16		
Staines & Son	525 0		

[Estimate of architect (Education), £490.]

Brixton, Stanley-street (Painting Interior and Exterior).

W. Fitch	£1,225	Maxwell Bros., Ltd.	£513
J. Appleby & Sons	842	Rice & Son	497
W. T. Bennett	570	H. Bragg & Sons, Ltd., 19, Robsart-street, Brixton*	457
W. A. King	557		
Lathey Bros.	535		
W. Read	522		

[Estimate of architect (Education), £480.]

Greenwich, Greenwich-road (Iron Buildings—Painting Interior and Exterior).

W. Banks	£109 10	W. Hayter & Son, 62, Banning-street, East Greenwich*	£60 10
H. Groves	83 0		

[Estimate of architect (Education), £50.]

Hackney, S., Upton House Truant School (Cleaning the Interior and Painting the Exterior).

J. Stewart	£620 0	H. Bouneau	£368 10
Staines & Son	510 0	F. Stevens & Sons	363 0
W. Sharmur & Sons, Ltd.	476 0	R. Woollaston & Co.	360 0
J. Grover & Son	434 0	W. Silk & Son, 13, High-street, Homerton*	337 17
Vigor & Co.	398 10		
Barrett & Power	390 0		

[Estimate of architect (Education), £370.]

Hoxton, Napier-street (Painting Interior).

McCormick & Sons	£585	Barrett & Power	£432
Staines & Son	585	W. Chappell, 243, Elgin-avenue, Maida Vale*	430
Grover & Son	494		
Stevens & Sons	446		

[Estimate of architect (Education), £450.]

Hoxton, Shoreditch Technical Institute (Painting Interior).

W. Cubitt & Co.	£499 0	L. H. & R. Roberts	£386 0
W. Reason	419 10	G. Barker	366 0
Staines & Son	418 0	J. Grover & Son, Wilton Works, Islington*	346 0
Killby & Gayford	413 0		
W. Shurmur & Sons, Ltd.	401 15		

[Estimate of architect (Education), £310.]

Islington, S., Queen's Head-street (Painting Interior).

Patman & Fotheringham, Ltd.	£580	J. Grover & Son	£446
T. Cruwys	556	W. Chappell	395
McCormick & Sons	545	L. H. & R. Roberts, 34, Rheidol-terrace, Islington*	336
C. R. Price	472		

[Estimate of architect (Education), £380.]

Norwood, "Elm Court" (Painting Interior and Exterior).

W. Johnson & Co., Ltd.	£199 0	H. Line	£172 0
E. P. Bulled & Co.	186 0	W. Read, 43, Church-road, Brixton-hill*	147 0
Maxwell Bros., Ltd.	182 0		
J. & C. Bowyer	173 10		

[Estimate of architect (Education), £170.]

Peckham, Choumert-road (Painting Interior).

T. G. Sharpington	£550	E. Triggs	£427
W. T. Bennett	468	E. Proctor & Son	402
H. Bragg & Sons, Ltd.	447	J. Garrett & Son, 83, Balham-hill*	395
W. Chappell	435		

[Estimate of architect (Education), £365.]

Peckham, Wood's-road (Painting Interior).

W. A. King	£504 0	W. T. Bennett	£386 0
Lathey Bros.	487 0	W. Hayter & Son	384 10
W. V. Goad	469 0	W. Sayer & Son	379 0
Maxwell Bros., Ltd.	444 0	H. Kent, Beacon-road, Hithergreen*	267 0
W. Chappell	418 0		
J. Garrett & Son	389 0		

[Estimate of architect (Education), £350.]

Poplar, Byron-street and Bright-street (Cleaning Interior).

H. Bouneau	£250 15	G. Barker	£219 0
A. W. Derby	247 0	Vigor & Co., Kingstreet, Poplar*	206 0
J. Haydon & Sons	246 15		
R. Woollaston & Co.	240 0		

[Estimate of architect (Education), £210.]

Poplar, Cubitt Town (Painting Interior).

Vigor & Co.	£114 0 0	E. Proctor & Son	£99 0 0
Newell & Lusty	113 10 0	R. Woollaston & Co., 40, Turner's-road, Limehouse*	86 10 0
W. Banks	109 19 6		
H. Groves	105 0 0		
A. W. Derby	103 0 0		

[Estimate of architect (Education), £100.]

Poplar, Glengall-road (Painting Interior).

Newell & Lusty	£203 10 0	E. Proctor & Son	£149 0
A. W. Derby	194 0 0	R. Woollaston & Co., 40, Turner's-road, Limehouse*	140 0
W. Banks	174 18 6		
Vigor & Co.	168 0 0		
H. Groves	160 0 0		

[Estimate of architect (Education), £170.]

Poplar, Woolmore-street (Painting Interior).

H. Bouneau	£656 0	R. Woollaston & Co.	295 0
J. Haydon & Sons	644 0	A. W. Derby, 60, Mayfair-avenue, Ilford*	291 0
J. Scott Fenn	315 0		
G. Barker	311 10		
Vigor & Co.	310 0		

[Estimate of architect (Education), £300.]

St. Pancras, W., Haverstock-hill (Painting Interior).

J. C. Richards & Co.	£524	Stevens & Sons	£394
G. Foxley	480	W. Chappell, 243, Elgin-avenue, Maida Vale*	350
J. Peattie	449		
Marchant & Hirst	448		
A. H. Inns	440		

[Estimate of architect (Education), £285.]

Stepney, Settles-street (Painting Interior).

R. Woollaston & Co.	£496 0	W. Chappell	£420 0
W. Shurmur & Sons	473 10	J. Scott Fenn	399 0
W. H. Lascelles & Co., Ltd.	459 0	Vigor & Co.	380 0
G. Barker	449 0	A. W. Derby, 60, Mayfair-avenue, Ilford*	374 0

[Estimate of architect (Education), £370.]

Wandsworth, Eardley-road (Painting Interior).

W. Read	£349 0	J. Garrett & Son	£293 0
Maxwell Bros., Ltd.	346 7	Holliday & Greenwood, Ltd., Loughborough Park Works, Brixton*	247 0
Dowsett & Jenkins	328 0		
W. A. King	320 0		
W. Johnson & Co., Ltd.	299 0		

Estimate of architect (Education), £280.]

Wandsworth, Mitcham-lane (Iron Buildings—Painting Interior and Exterior).

E. P. Bulled & Co.	£223 10	Dowsett & Jenkins	£182 0
R. L. Ronald	205 0	W. Read, 43, Church-road, Brixton-hill*	158 0
Grace & Marsh	199 10		
H. Leney & Son	183 14		

[Estimate of architect (Education), £140.]

Woolwich, Wood-street (Painting Interior).

R. Woollaston & Co.	£440	J. Scott Fenn, 42, William-street, Woolwich*	£299
E. Proctor & Son	390		
H. Groves	373		

[Estimate of architect (Education), £350.]

Gordon House Girls' Home (Cleaning Interior).

Lathey Bros.	£293 0 0	H. Tinkler, 72, Northcote-road, St. Margaret's, Twickenham*	£253 19 11
J. W. Brooking	277 0 0		
Chinchen & Co.	219 15 0		
Speechley & Smith	215 0 0		
S. N. Soole & Son	202 15 0		

[Estimate of architect (Education), £250.]

LONDON.—For the heating apparatus of the Gopsall-street school, Haggerston:—

J. Defries & Sons, Ltd.	£445 0	Stevens & Sons	£395 0
The Paragon Heating Co.	437 10	J. Yetton & Co.	379 17
J. Grundy	437 0	Comyn, Ching, & Co., Ltd.	379 10
J. Richmond & Co., Ltd.	417 10	G. & E. Bradley	353 0
J. & F. May	403 10	Bolton, Fane, & Co., 298 and 300, Goswell-road*	339 0
C. Kite & Co.	400 0		

[The estimate of the architect (Education) comparable with these tenders is £395.]

LONDON.—For extending the heating apparatus, etc., of the enlargement of the Alma pupil teachers' school, Bermondsey. Included in this estimate was a sum of £285:—

F. Burkitt	£463 0	Stevens & Sons	£312 0
J. Grundy	417 0	Comyn, Ching, & Co., Ltd.	282 10
J. Defries & Sons, Ltd.	370 0	H. J. Cash & Co., Ltd.	268 0
J. Boyd & Sons	356 0	Bolton, Fane, & Co., 298 and 300, Goswell-road*	252 0
C. Kite & Co.	350 0		
Palowkar & Sons	338 0		
F. W. Brock	328 10		
J. & F. May	326 0		

[The estimate of the architect (Education) comparable with these tenders is £250.]

LONDON.—For heating apparatus, Latimer-road school, Hammersmith:—

Palowkar & Sons	£237 0	G. Davis	£160 0
F. Burkitt	223 0	H. J. Cash & Co., Ltd.	164 0
J. Gray	210 0	J. Yetton & Co., 4, Carr-street, Limehouse*	156 12
C. Kite & Co.	200 0		
Stevens & Sons	196 0		
F. W. Brock	193 5		
G. & E. Bradley	189 10		

[The estimate of the architect (Education) comparable with these tenders is £180.]

LONDON.—For the division of room B in each of the boys' and girls' departments of the Windsor-road school, Hackney, S.:—

H. Bouneau	£355	General Builders, Ltd.	£333
E. Lawrence & Sons	355	E. Spencer & Co.	333
W. Shurmur & Sons, Ltd.	351	McCormick & Sons, Northampton-street, Essex-road, Canonbury*	328
Barrett & Power	345		
J. Grover & Son	338		

[The estimate of the architect (Education) comparable with these tenders is £376.

LONDON.—For 950 tons of cast-iron pipes and castings, for the Metropolitan Water Board. Mr. W. B. Bryan:—

	Price per ton Turned and Bored.		
Cochrane & Co.	£5 10 0	£5	5 0
Staveley Coal and Iron Co., Ltd.	5 5 0	5	2 6
Stanton Ironworks Co., Ltd.	4 18 4‡	4	15 10‡
Holwell Iron Co.*	4 18 4	4	14 4

‡ 2s. 6d. per ton extra for coating.

LONDON.—For alterations and repairs to 3, Devonshire-square, Bishopsgate-street, E.C. Mr. H. Seymour Couchman, architect, 522, High-road, Tottenham, N.:—

A. Porter	£507 0	Snewin Bros. & Co.	£495 0
Waring & Gillow, Ltd.	505 10	J. Groves & Sons.	463 10
		H. Brown*	461 0

MIRFIELD.—For erecting a shop, house, and slaughter-house, for Mr. F. Lister. Mr. E. Vincent King, A.R.I.B.A., 24, Westgate, Dewsbury. Quantities by the architect:—

Bricklayer and Mason: J. Horkin, Liversedge* £427 15 0
Carpenter and Joiner: R. Naylor, Mirfield* .. 140 0 0
Slater: A. Thompson, Liversedge* .. 34 10 0
Plasterer: A. Shaw, Mirfield* .. 21 6 0
Plumber: C. C. Cardwell, Brighthouse* .. 82 3 5
Painter: J. C. Ledgard, Mirfield* .. 12 1 6

NEWCASTLE-ON-TYNE.—For erecting a warehouse in High Friar-street, for Messrs. W. D. Mark & Sons. Mr. J. W. Dyson, architect, 67, Grey-street, Newcastle-on-Tyne:—

Elliott Bros.	£1,100 0 0	J. McElhatton, jun.	£795 4 4
J. & W. Lowry	900 0 0	J. White	795 0 0
N. W. Maughan	897 12 11	Brown & Bell	793 11 4
J. C. Ferguson	888 0 0	Exors. J. Arundel	764 17 0
J. Lunn	867 3 0	W. Hall	764 16 6
W. J. Robertson & Sons	858 15 0	Veitch & Jordan	762 16 4
E. R. Davison	854 9 6	J. Milne	759 3 0
J. Craven	853 6 7	T. Hutchinson	745 9 0
T. Hunter	850 0 0	W. Franklin & Sons, Ltd.	729 1 9
S. F. Davidson	837 3 6	S. Fenwick & Co.	725 0 0
J. C. Hope	834 14 0	Kirk & Brown, Newcastle*	722 2 5
E. Weatherley	830 2 6		
E. T. George	819 18 6		
F. J. Hepple	813 19 0		
T. Lumsden	812 2 7		

NEW HERRINGTON.—For erecting a pavilion and fives court on enclosed recreation ground, New Herrington, for the Workmen's Club. Mr. J. Palliser, architect, Philadelphia, co. Durham. Quantities by architect:—

J. Foster	£752 14
Hall & Wharton, Sunderland*	726 15

NORTH FERRIBY.—For providing and laying a 12-in. pipe sewer, etc., in Swanland Hill, about 274 yds in length, with manholes, for Sculcoates Rural District Council. Mr. W. H. Wellsted, engineer, Prince's Dock-chambers, Hull. Quantities by Messrs. Wellsted & Easton, Prince's Dock-chambers, Hull:—

A. H. Atkinson	£176 12 0	J. Kirby & Son	£123 2 9
T. B. Knox & Co.	144 5 0	H. Medforth	123 0 0
G. Curtis	143 16 0	A. E. & A. Kirby	122 10 0
N. Stephenson	139 15 0	R. Fisher & Son	118 10 0
G. H. Wray	137 1 0	T. Burrell, Hull*	96 3 0
Barnard & Scott	125 18 6		

OLD TRAFFORD.—For the erection of a caretaker's house at the Council Offices, for the Stretford Urban District Council. Mr. E. Worrell, Surveyor, Council Offices, Old Trafford:—

W. A. Peters & Sons	£612 0	J. Gerrard & Sons, Ltd.	£470 0
J. Caldwell	536 0	Pearnley & Sons	460 10
C. Normanton & Son	497 0	Young, Tinker, & Young	458 0
W. Brown & Sons	489 0	Burgess & Galt	455 0
J. & J. Parish	475 0	A. Hodkinson	446 0
W. Thorpe	473 0	R. Carlyle	430 0

PENYRHEOL.—For erecting nineteen dwelling-houses, for the Trustees of Penyrheol Building Club. Mr. G. L. Watkins, architect, Rectory-road, Caerphilly:—

C. Nichols	£231 0	T. F. Howells	£210 0
H. Davies & Son	229 0	J. Williams	210 0
R. & J. Evans	229 0	A. J. Rossiter, Caerphilly*	210 0
J. Lloyd	215 0		
F. Bristow	214 10		

PONTYPOOL.—For alterations to the Prince of Wales and Three Salmons, Pontypool. Messrs. Swalwell & Havard, architects:—

	Prince of Wales.		Three Salmons.	
	Painting.	Alterations.	Alterations.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Poulton & Whiting	13 13 4	86 8 7	205 0 0	305 0 0
O. Roberts	17 0 0	86 0 0	192 10 0	295 10 0
A. S. Morgan & Co.	13 0 0	95 0 0	180 0 0	288 0 0
J. Bevan	10 6 6	91 13 0	175 4 6	277 4 0
E. G. Williams	—	107 10 0‡	165 0 0	272 10 0
J. Knowler	10 7 6	79 10 0	178 15 0	268 0 0
G. Cookham	12 0 0	85 0 0	168 0 0	265 0 0
E. G. Clarke, Newport	10 15 0*	74 10 0*	173 0 0	258 5 0
J. Jenkins, Ltd.	10 0 0	81 0 0	166 0 0	257 0 0
Clements & Co.	12 18 0	85 5 0	158 0 0	256 3 0
F. W. Powles	11 10 0	74 0 0	165 0 0	250 0 0
G. F. Leadbeter, Newport	10 19 6	79 3 0	146 18 6*	237 1 0

‡ Not Divided.

PENARTH.—For the construction of tumbling bays, manholes, flushing tanks, and 580 lineal yds. of stoneware pipe sewers, for the Urban District Council. Mr. E. J. Evans, Surveyor, Council Offices, Penarth:—

Collins & Co.	£1,616 14 0	T. Bevan	£759 0 0
Hatherley & Co.	1,005 10 9	Mackay & Davies	732 18 3
E. Powell	967 6 5	G. Rutter	714 5 9
Barnes, Chaplin, & Co.	763 6 2	W. Burton‡	643 7 0
		F. Ashley, Cardiff*	709 8 11

‡ Withdrawn.
[Surveyor's estimate, £700.]

PENRITH.—For sewerage works (Contract No. 1), for the Urban District Council. Messrs. Brierley, Holt, & Co., engineers, Blackburn and Blackpool. Mr. J. J. Knewstubb, Resident Engineer:—

J. Jackson	£3,846 3 6	E. J. Hill	£2,444 5 6
J. S. Dawson	3,159 7 0	Hooper, Neary, & Co.	2,348 2 5
W. Carr	2,851 8 0	T. Egan & Sons	2,320 10 0
J. Laing & Son	2,735 8 6	J. W. Broadhead	2,379 1 11
E. Taylor	2,661 11 11	W. Morley & Sons	2,264 16 0
Clegg Bros.	2,709 11 4	J. Farrell	1,946 9 1
J. Moore	2,707 15 0	J. Mackay & Sons, Edinburgh*	2,136 15 9
Brebner & Co.	2,695 0 0		
G. Read & Sons	2,529 15 3		
J. Mackay	2,617 17 6		
W. Grisenthwaite	2,478 0 11		
H. C. Buckley	2,436 11 0		

RISCA.—For rebuilding the Riflemans Arms and Foresters Arms at Risca. Messrs. Swalwell & Havard, architects:—

	Foresters Arms.	Riflemans Arms.
Clements & Co.	£1,600 0 0	£920 0 0
C. H. Reed	1,572 0 0	890 0 0
E. R. Evans & Co.	1,535 10 0	905 14 3
Hughes & Sterling	1,502 0 0	935 0 0
F. W. Powles	1,467 0 0	857 0 0
J. Jenkins, Ltd.	1,447 0 0	949 0 0
A. S. Morgan & Co.	1,418 0 0	877 0 0
E. G. Clarke	1,390 0 0	860 0 0
G. F. Leadbeter	1,387 0 0	835 0 0
Jerman	1,382 10 0	765 0 0
Poulton & Whiting	1,370 4 6	858 1 2
J. H. Leadbeter, Newport*	1,348 0 0	784 0 0
Herbert	1,150 0 0	750 0 0
Knowler	—	862 10 0
Coakham	—	847 0 0

SEAFORD.—For stabling, riding school, and house, for Seaford West Co., Ltd. Messrs. Cooper & Coussens, architects, Eastbourne. Quantities by Mr. H. Curtis Card, F.S.I., Q.S.A.:—

D. Lee	£4,583 15 0	Peerless Dennis & Co.	£3,978 0 0
J. Barker & Co., Ltd.	4,178 0 0	Godfrey Bros.	3,936 0 0
J. H. Smedley	4,153 16 8	Cook & Son	3,880 0 0
W. F. Blay	4,100 0 0	H. Brown	3,815 0 0
F. Gough & Co.	4,094 0 0	W. Wilkinson, Seaford*	3,651 0 0
Kirk & Randall	3,993 0 0		

STONEHAVEN.—For erecting a workshop at Invercarron, for Messrs. J. Jack & Sons. Mr. G. Gregory, architect, 24, David-street, Stonehaven:—

Brickwork: W. Smith & Co., Stonehaven *Carpentry*: R. Thomson & Sons, Stonehaven *Slating*: R. Burness, Stonehaven *Plumbing*: M. Cruse, Stonehaven *Steelwork*: J. Abernethy & Co, Aberdeen *Glazing*: Helliwell & Co., Brighouse	£854 6 9

TUPSLEY.—For the erection of a villa residence on the Highfield building estate, Tupsley, Hereford, for Mr. James Clarke, Cinderford, Gloucestershire. Messrs. Groome & Bettington, architects and surveyors, Palace-chambers, Hereford:—

E. J. Davies	£537 10	J. T. Jones	£455 0
E. W. Wilkes	519 0	Woolley & Sons	450 0
J. Hiles	475 0	W. C. Bolt, Hereford*	450 0
C. Cooke	470 0		
W. Powell	470 0		

TYLDESLEY.—For alterations to hydraulic drains, etc., for the Tyldesley-with-Shakerley Urban District Council. Mr. R. H. Ginnian, engineer:—
Newton, Chambers, & Co., Ltd., Sheffield . £166

URMSTON.—For flagging and kerbing of footways of Station Bridge, for the Urban District Council. Mr. J. Heath, Surveyor, Council Offices, Urmston:—

H. M. Nowell	£137 2 0	T. W. Rigby	£89 7 2
W. Clarke	129 0 8	G. Clarke & Son	88 5 0
J. T. Hayes	129 0 6	Johnson & Hindley, Eccles*	85 17 4
W. Snape & Son	97 6 0		
W. H. Worthington	91 16 4		

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